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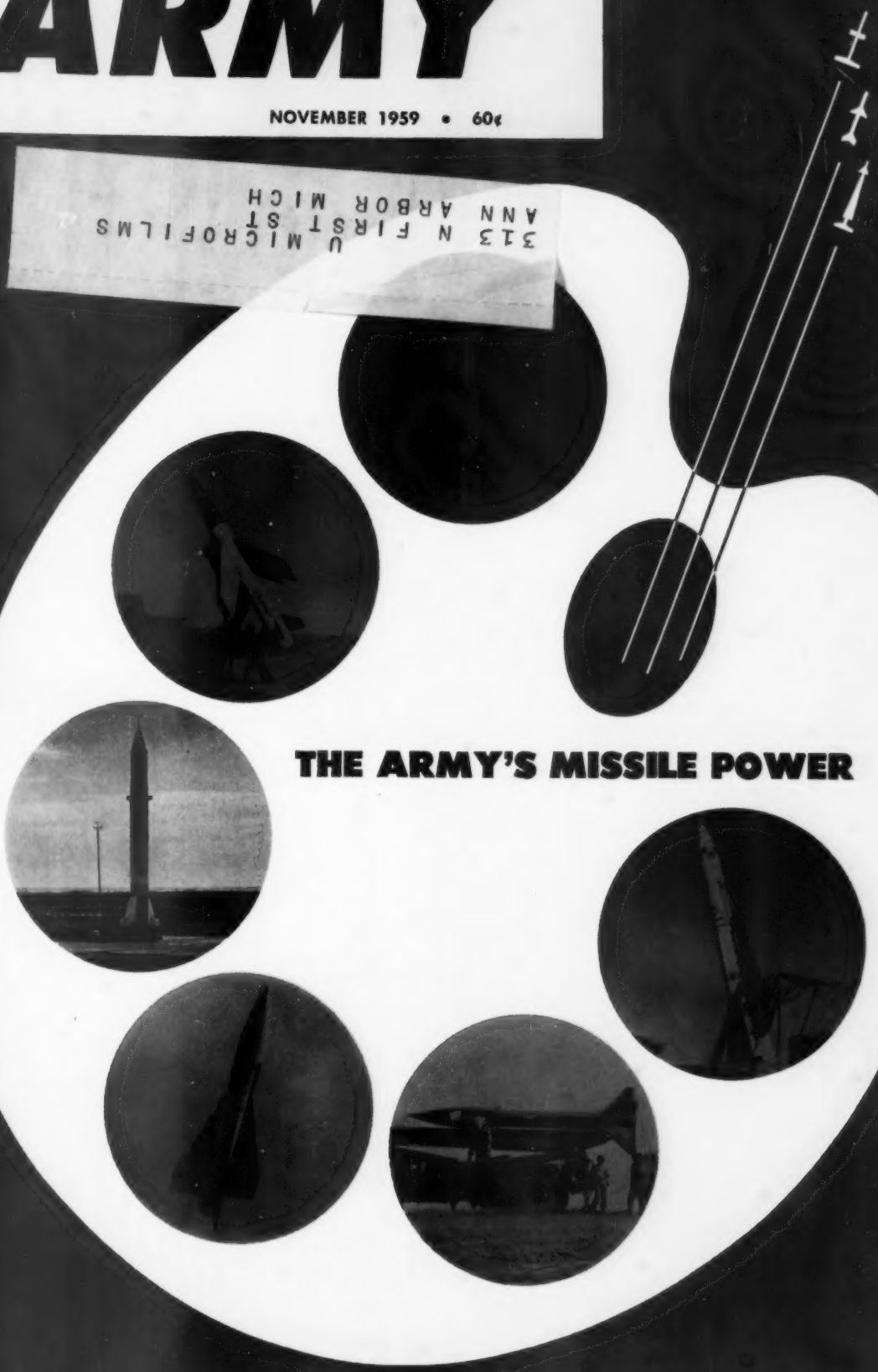

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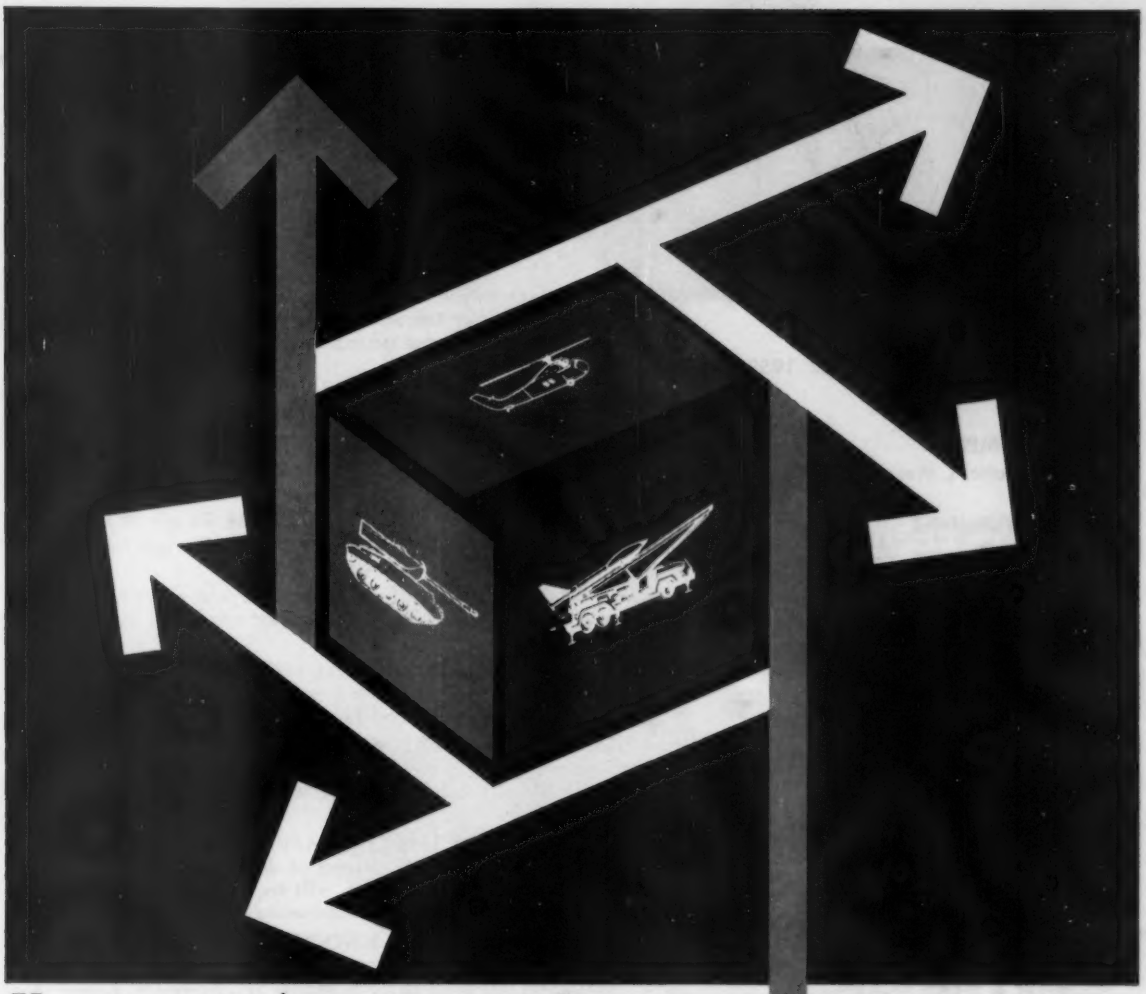

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ARMY

magazine of the
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Col. Arthur Symons, USAR

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Assistant—Annette Loukas

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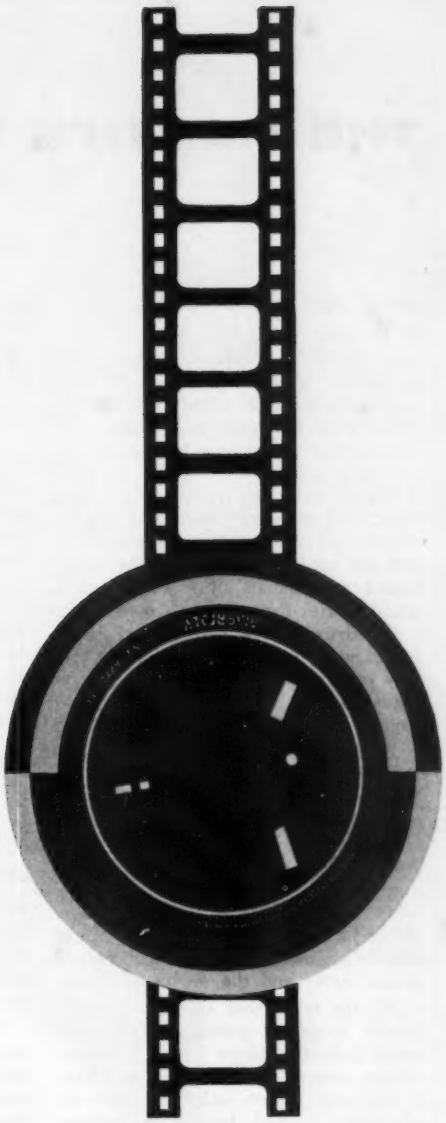

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THE MONTH'S MAIL

DON'T RUN OUT OF GAS

• Recently it was decided that space research and the weapons therefor would be the job of the Air Force, and that any hardware to be pitched beyond the Wild Blue Yonder would require the Army and Navy to do a little hitch-hiking, as in airlift.

Maybe from this will develop a new branch of military power—the Space Forces—and some current Billy Mitchell will get tried for lambasting the earth-bound air generals. But perhaps such parallels with the past won't materialize.

Quadruplification of our fighting forces might yet occur. Or perhaps this may call for one of those agonizing re-appraisals which seem to be coming too close together.

Perhaps such a new look at the New Look might bring out the idea that the Space Age stuff and SAC should be the main area of USAF. Tactical air will either turn into the present short-range missiles, or the relatively slow propjets may return to add duration and heavy-weapons load to the battlefield. Perhaps the unglamorous task of air supply might well be shared out between the ground-bound Army and the sea-bound Navy.

All the talk about using rockets for supply hangs on getting stuff lowered softly into the target area. A week's rations smeared into a large hole where a few retro rockets failed, or one's replacement hashed because a braking chute did not open, lead to discontent. These bugs will no doubt be exterminated in time, but currently we are stuck with vehicles which travel slower but get there.

Once I read a science-fiction story in which the remnants of the U. S. Army still at large had come onto a new system of weapons. The mad scientist in charge had a plan for the total destruction of the dastardly invaders, but the outfit's cook shot him off Cloud 10 by asking when he planned to come down to eat. Someone always brings down a shillelagh of fact upon the ivory dome of theory.

At present we are given a lot of tales about what our stuff will do, but the only sad fact is that we have pilot models galore, and in some cases, funds do not allow the production to get going. Perhaps this shooting down of the Army's rocket plans may allow the many currently half-baked pies to get fully cooked. But I also hope the Air Force doesn't get so far off the ground that it can't get down to eat from time to time. Toward the end Der Fuehrer was hiring a lot of gutty generals who were all dash and no logistics. They are all writing tales of how they'd have done it if they hadn't run out of gas.

CWO JOHN P. CONLON
Newark, Ohio

USE OF USAR AND ARNG

• The Army is missing a good bet by improper handling of USAR and ARNG technical services enlisted personnel on individual short active-duty tours for training.

These soldiers, when called to active duty for training, in many instances are assigned to installation technical services sections for on-the-job training. However, these sections are seldom given advance notice that these soldiers are to be assigned, or when. This means that often no organized training program is established for them. So, more often, than not, they are shifted from one section to another each day in the hope they might pick up a little knowledge on the way. Worst of all, when the tech services are loaded down with work and no time can be spared for any form of instruction the reservist is likely to find himself on a grass-cutting detail or such.

The one thing the reservist learns for sure is that the people who should be interested in teaching him something of the Army, are primarily concerned with getting rid of him so they can get back to their own jobs. When he returns home he can confirm those ugly rumors about how wasteful the Army is. When the home folk ask him about his active-duty

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experiences, he can tell them about the exciting days spent cutting grass or sitting around all day waiting for a ten-minute orientation lecture on the operation of some section. By the time his training period is up he is firmly convinced that he has wasted his time with the whole affair.

This is unfair to the soldier concerned and to the Army. The only thing accomplished is alienating what should have been kept as a good friend and spokesman for the Army.

I believe all installation tech services sections should establish standard training programs for reservists that could be put into effect on very short notice, or no notice at all. One plan I would like to see go into effect would be for the reservist to be sponsored by a Regular Army man during his tour of active duty. Instead of shifting the reservist from section to section, have him work daily side by side with an RA man of his rank and MOS field. Then the reserve soldier would learn more in two weeks than he can in six months the other way. I believe both reservist and RA would end up with much more respect for each other and a better understanding of the other guy's problems.

MSgt. Raymond R. Bowles
Columbus, Ga.

PATRON SAINT

● May I register the opinion that readers Randle, "Protestant Christian," and Halstead ["The Month's Mail," September] did not "think out" their criticism of "St. Maurice: Patron Saint of Infantrymen" [July] and Army's editor was far too weak in defense of a fine article?

Soldier Maurice has no more to do with the Catholic Church than with the Protestant. He died almost a thousand years before the Reformation. However, what he died for is vital today. The only difference between the armies of the West and the armies of the East is our Judaic-Christian heritage of belief in God and the stature of Man. True, there are some heathens and atheists in our Army, but they do not represent the mass of our people or the tradition we serve. It is to the everlasting discredit of Hitler's soldiers that there was no "Theban Legion" to oppose atrocities.

Conscience, nobility, courage, loyalty, and sacrifice are perfect subjects for Army—even if a few readers call this "religion." Were it that there had been more "Thebans" among our Korea POWs.

Capt. Robert De Marcellus
Palm Beach, Fla.

TRAINING FOR M-DAY

● It would appear that the Army is missing a good bet in its mobilization planning.

Certainly here at Fort Bliss, and I should imagine at most of the other large posts in the continental limits, there are enough reserve officers now serving as enlisted men to staff a full division, with the possible exception of enough colonels and lieutenants to go around. If DCS for Personnel was right at the time of the RIF a year ago last October they are good officers (just not good enough for peacetime). *But*, they are getting rusty.

These officers could be grouped into a reserve division. In lieu of mandatory training in supply economy, code of conduct, seasonal hazards, and such they could devote the same time to the concept of the Pentomic division, and study such things as the latest techniques of their branch, the capabilities of the newest equipment. All this would be at little or no extra expense to the Army.

Thus in case of need the Army would have available the nucleus of a number of divisions. Activation would be a matter of minutes, long enough to go home and change insignia. As all members would be in the Army, no time would be lost over physical examinations, clearing up personal affairs, and reporting to a station. All members would be acquainted and, to a certain extent, accustomed to working together.

S/Sgt. Henry P. Walker
El Paso, Texas

MODERNIZE THE HQ

● I would like to add my support to the challenge issued by Lt. Colonel Wesley J. Curtis in the article titled "Job for R & D." It is a practical impossibility to operate with Division or Battle Group Headquarters TE equipment in a fast moving situation. Lack of manpower is not the least of the problems. When the CP is finally in operation, after a Herculean effort, it is a clumsy, inefficient, and uncomfortable establishment. Lighting is a haphazard affair of about two candle-

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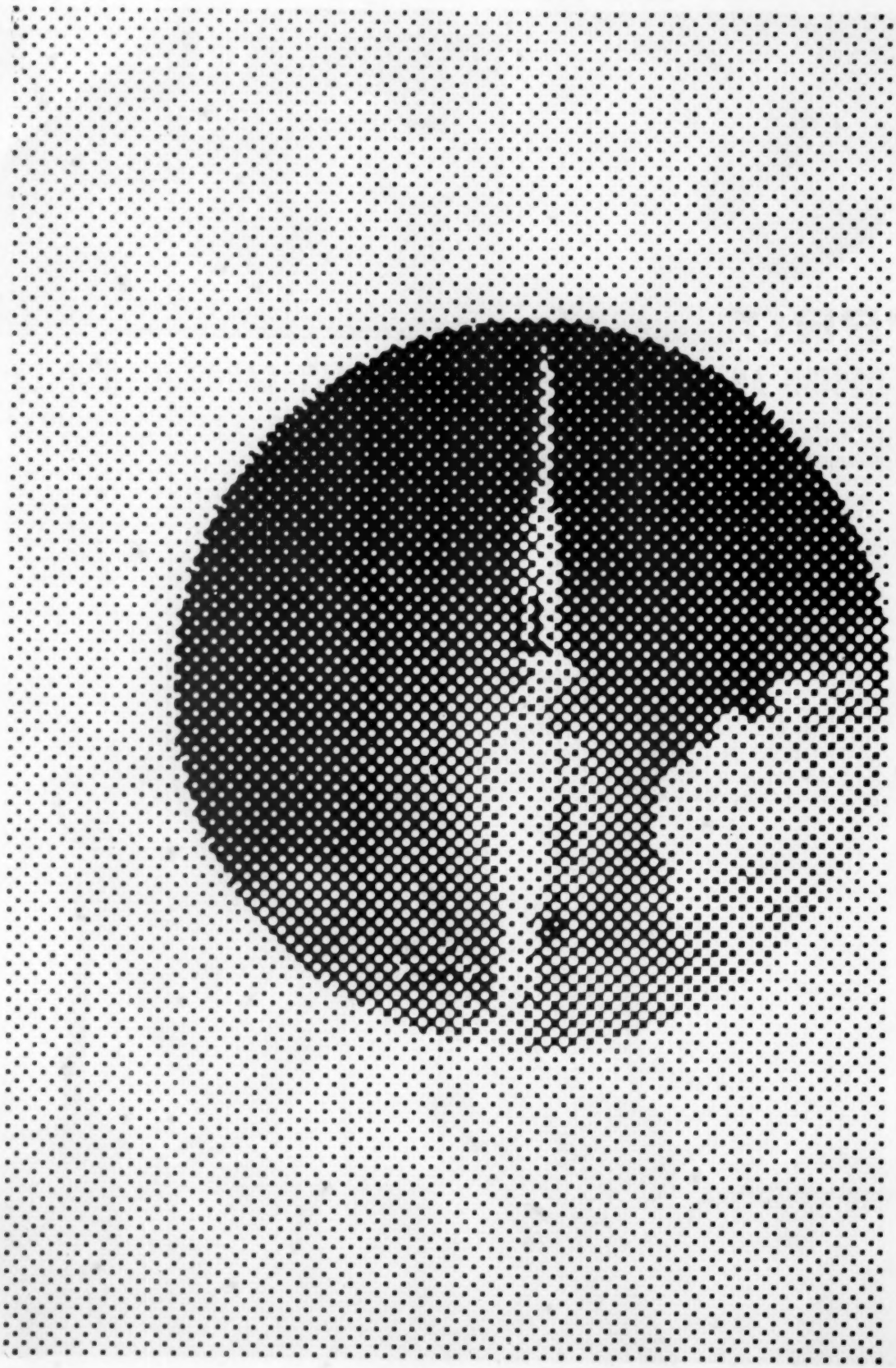

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To accomplish the job of command we must move the Headquarters out of the Civil War or Napoleonic era (take your choice).

COL. ROTH S. SCHLECK
Milwaukee, Wisc.

RECOMMENDED READING

• An article in the August 8th issue of *The Saturday Evening Post* by Hanson W. Baldwin entitled, "Our Fighting Men Have Gone Soft" is one that warrants your attention.

It is so true, outspoken, and unbelievably to the point that I recommend it to every member of your staff and your reading public. If the article cannot be reprinted in ARMY, I feel it should at least be recommended to your readers.

Mr. Baldwin says many things that have needed saying for a long time.

1ST LT. ROBERT S. SANDLA
Lawton, Okla.

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THE ARMY'S MONTH

AUSA ISSUES STATEMENT ON TRANSFER OF ABMA TO NASA

(This statement was released by AUSA on 23 October)

It is the position of the Association of the U. S. Army that the decision of President Eisenhower to transfer the Development Operations Division of the Army Ballistics Missile Agency to the National Aeronautics and Space Administration will greatly strengthen the nation's lagging space program.

However, it is most important that the details of the transfer neither seriously disrupt the work of the Von Braun team nor adversely affect the Army's present and future military missile development capabilities.

If the transfer of this brilliant and competent group of space scientists is conducted in an orderly manner, without impairing the morale of members of the team or disrupting work schedules, the decision will most certainly be in the interests of the national space program. Evidence of this lies in the fact that the decision gives a green light to the continuation of the Project Saturn program.

The Army's military missile development capabilities will not be adversely affected *provided* those members of the Development Operations Division of ABMA who are presently engaged in and are most interested in the Army's missile program are retained by the Army. It is understood that this is contemplated and that ABMA and NASA believe they can work out a redistribution of personnel that will be in the best interests of both the Army and the space agency. The major Army project presently assigned to ABMA is the Pershing surface-to-surface missile. Work is also continuing on the Redstone and Jupiter surface-to-surface missiles.

It must be recognized that Army military missile developments could be delayed if certain Redstone Arsenal facilities are taken over by NASA. In such an event emergency construction funds will be needed to replace such facilities as the Army's programs require.

Final effects of the transfer cannot be known until the Army and the space agency have worked out details. It is expected that this will take seven or eight weeks. Moreover the transfer cannot become effective until about 1 March 1960, since Congress has sixty days after it reconvenes to determine whether or not it will object to the transfer.

In making its decision that the transfer of this Army resource to the space agency is in the best interests of the nation, the Association of the U. S. Army was cognizant of the position of the Army leaders most intimately involved.

It has noted that General Medaris has stated that he is "confident that we will be able to work out, with Dr. Glennan, a thoroughly detailed and well organized arrangement which will meet with the approval of Congress."

It has considered the joint statement of the Secretary of the Army and the Chief of Staff that the "Army wholeheartedly supports the decision" and "will make every effort to effect the transfer smoothly and efficiently."

AUSA has especially noted this statement by Dr. Von Braun: "The major concern of my colleagues and myself is that we be permitted to continue to devote ourselves to this country's space efforts. The President has decided that it is in the best interests of the country that our work be done within the framework of NASA. Since NASA's establishment a year ago we have worked closely and harmoniously with that fine organization.

"We look forward to a continuation of our efforts with NASA in a progressive space program which will make this nation second to none."

Finally, AUSA has noted that responsible leaders of Congress have stated they intend to thoroughly investigate the proposed transfer. This, the Association of the U. S. Army believes desirable, provided the investigation is conducted in an impartial and constructive manner and for no other purpose than to further the nation's security in this age of peril.

ABMA—A NATIONAL ASSET

That the Army team at Redstone Arsenal is an American national asset was penetrating the American mind long before the President decided to transfer it to NASA.

The three quotations that follow give evidence of this.

Conceding that it was baffled by recent Pentagon decisions in space research, *The Portland Oregonian* said the recent switch of space projects from ARPA to USAF "stirs no confidence." The USAF has achieved "much less impressive results than has the Army" in efforts to overhaul USSR in the space race, the *Oregonian* said. The decision to make the Air Force "top dog" in military space "appears to jeopardize Army's ballistic missile center . . . where an expert team under Dr. Wernher von Braun has been responsible for a major share of successful U. S. space launchings." Noting that Dr. Glennan of NASA had said that "we should admit, quite frankly, that with distressingly few exceptions, we have not achieved complete success in any mission to date," the *Oregonian* added that "this harsh assessment takes on new gravity in light of the announcement that the nation's space eggs will be concentrated in USAF basket, where they will be in hands of those who have thus far run second-best. . . ."

The Birmingham News viewed the recent Pentagon decision as apparently "one more effort . . . to slough off Army, despite fact that the Army has accomplished more in way of successful missile development and launching than any other branch of the service."

And *The New York Daily News* with its usual vigor asked, "what hap-

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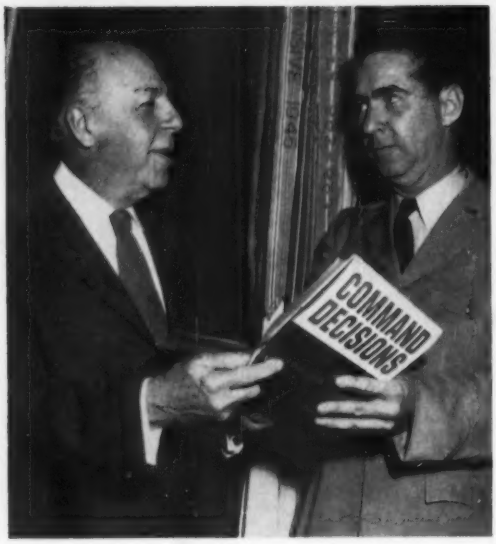

The Army's Chief of Military History, Brig. Gen. James A. Norell, presents to Secretary of the Army Brucker, a copy of *Command Decisions*, a study of 20 crucial decisions made by allied and enemy commanders during World War II prepared by OCMH historians.

pens to Dr. Von Braun and his experts?" "Our earnest hope is that, whatever the President's decision, he will do nothing to disturb or hamper Von Braun or curtail the activities of his Redstone team. We have no more nearly indispensable space man than Von Braun."

REPORT FROM KOREA: *SHORTAGES OF MEN AND WEAPONS*

IGOR OGANESOFF

Staff reporter of The Wall Street Journal

MUNSAN, KOREA

When Sergeant Nicholas Hughes of A Company, 5th Cavalry Battle Group, orders his rifle squad into dug-in positions along the demilitarized zone bordering Communist North Korea, only one American soldier springs into action. The other six men of the understrength squad who scramble into foxholes are Koreans, borrowed from the Republic of Korea army to beef up thin Yank ranks.

Over at D Company's weapons platoon, commanded by frustrated, young Lt. Christopher Wren, two of the unit's three battered 81-millimeter mortars recently were out of commission for weeks for repairs, and the third lacked a sight. Eight of the platoon's 29 men couldn't wear their steel helmets because no liners were on hand. On a recent 24-hour mock combat exercise the troops fiddled with four defective field radios, wound up signalling with flares.

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Isolated instances of military snafus? Hardly. First-hand observation and talks with commanders and GI's indicate such examples of military unpreparedness are far from uncommon in Uncle Sam's Army in Korea. Despite a record $40 billion Pentagon budget for defense, equipment for ground troops—ranging from guns to food containers—often runs short or becomes unreliable and fighting units operate short of manpower, sometimes to the point of dangerously impairing combat readiness.

Nobody really expects a flare-up of fighting here in the near future. But, six years after the armistice that ended three years of bitter war against Korean and Chinese Communists, this, along with Germany, remains one of the few spots where U. S. forces face Red troops on a definite "front."

No one here knows for sure the number, fighting condition or intentions of these Communist troops. But many front-line U. S. soldiers obviously have misgivings about their own strength.

For one thing, under a rotation system, every Yank from buck private to division general is shipped back to the U. S. after 13 months of Korean duty, whether replacements have shown up or not. As a result, manpower levels fluctuate wildly, sometimes slipping to as low as 25 per cent of full strength (including South Korean troops) for weeks at a time.

"You call this a modern pentomic division?" snorts an embittered 5th Cavalry Battle Group company commander in his front-line Quonset hut office. "The shape we're in now, we couldn't fight well if we had to."

To counter any threat of Communist troops overrunning South Korea, the U. S. still stations two divisions in Korea to supplement the 630,000-man army of the Republic of Korea. The U. S. Force, which makes up the 8th Army, includes the 1st Cavalry Division (a misnomer since it's made up of infantry) and the 7th Infantry Division. The 1st mans a portion of the "front" and the 7th currently is held in reserve. They're supported by heavy artillery and rocket battery capable of firing nuclear warheads, plus miscellaneous service units. The number of U. S. troops in Korea is a secret, but few observers put it at more than 40,000 even during peak periods.

Top Army brass are on record that the "8th Army has lost none of its morale and professional skill which made it famous in the Korean War." Earlier this year, Army Secretary Wilber Brucker, commenting on the 8th Army, as well as the 7th Army in Europe, told the Senate Armed Services Committee: "You may rest assured that both of these armies are powerful, well-trained and combat ready."

But many of those who man the long Korean "front" insist that various units at one time or another suffer from serious deficiencies of supplies and manpower.

Uncle Sam's warriors here often must gingerly nurse along aged military hardware. "We can keep our vehicles and guns in reasonably good shape if we don't push too hard," comments a 1st Cavalry Division motor pool officer. "But in actual combat this old equipment would fall apart in a week."

This salty Zippo lighter saw plenty of action in World War II. Its owner, a retired Lt. Comdr., still uses it every day.

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New Zippo Slim-Lighter. Same dependable action, polished chrome.

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Some veterans here also question how many of their colleagues are physically "combat ready." They contend ranks of platoon sergeants and other noncommissioned officers are sprinkled with graying heads and pot bellies. While some of these sergeants who have to lead their men into practice hill assaults are undoubtedly combatwise and fit, others have come from comfortable office jobs with little preparation for grueling front-line assignments.

It would be an exaggeration to suggest that all the aforementioned shortcomings exist constantly, or in all units, or even that U. S. troops and officers agree as to their own state of preparedness. Indeed, some outfits and commanders deny outright, or at least shrug off, any reported difficulties, often with an impressive showing of esprit de corps.

Capt. Thomas Wilson, commander of B Company, 8th Cavalry Battle Group, the closest U. S. unit to Red Korean positions, insists he has no supply worries at all. "All you have to do is yell loud enough and you can get what you need," he snaps. Capt. George Cooper of D Company contends that much depends on the personal initiative and effort of commanders in getting proper supplies quickly.

Another "soldier of the future"—this one from the Infantry Center at Fort Benning—demonstrated to the JCOC.

Col. Paul V. Tuttle, a 7th Infantry Division battle group commander, insists there aren't any real military deficiencies in his outfit. Another colonel, in charge of supplies at the 8th Army headquarters in Seoul, boasts, "Our supply system here is as good as anywhere."

Nevertheless, others in the field are convincing in their tales of frustration and defeat in trying to keep men and gear in fighting trim.

"We have tool requisitions dating as far back as two years which haven't been filled yet," remonstrates a veteran supply sergeant in the 5th Cavalry. An officer in this unit recalls he once opened up a crate of supposedly new rifles to find they were rejects.

"The only way I can get parts is to tour the supply depots to scrounge what I need," says another unit commander. "This means that somebody else isn't getting what we took and the shortage has just shifted from us to another unit."

"Our trucks need tires and fan belts," says a 19-year-old GI driver. "I couldn't get boots for one of my men for a couple of months, so he couldn't go out on problem exercises," reports a platoon sergeant. Another soldier complains about a dozen men in his company currently lack field packs. And a fuming mess sergeant says his special cans to transport meals into the field have broken latches, causing food to spill and get cold, but he can't get new ones.

Maj. Gen. Charles E. Beauchamp, commander of the 1st Cavalry, admits some supply and personnel problems do exist. One cause, he believes, is the closing of U. S. supply depots in Japan, which means requisitions now have to go to the U. S. He concedes that much Army equipment on hand is now too old for economical or reliable operation in the dusty, mountainous Korean terrain.

There are some, of course, who discount the seriousness of any manpower and supply problems in Korea because, so the argument goes, intelligence should be able to signal any Communist troop build-up weeks before an attack, and anyway, they add, the Republic of Korea army presumably is being trained and equipped to handle any enemy.

In addition to the separate ROK army, there are some 15,000 Korean troops who are employed as KATUSA —Korean Augmentees to the U. S. Army. Theoretically, they make up one-third of the strength of the American divisions. Actually, they outnumber the Yanks in combat platoons. Be-

Shown here is one of the many Army weapons demonstrated during the meeting of the American Ordnance Association at Aberdeen Proving Ground on 8 October. It is the new T-195 self-propelled howitzer which has an all-aluminum hull that makes it lighter than older models of the SP 105. Air-transportable, the T-195 can carry 89 rounds of a new longer-range round and has other improvements.

The Checkout that says "GO" or "NO GO"

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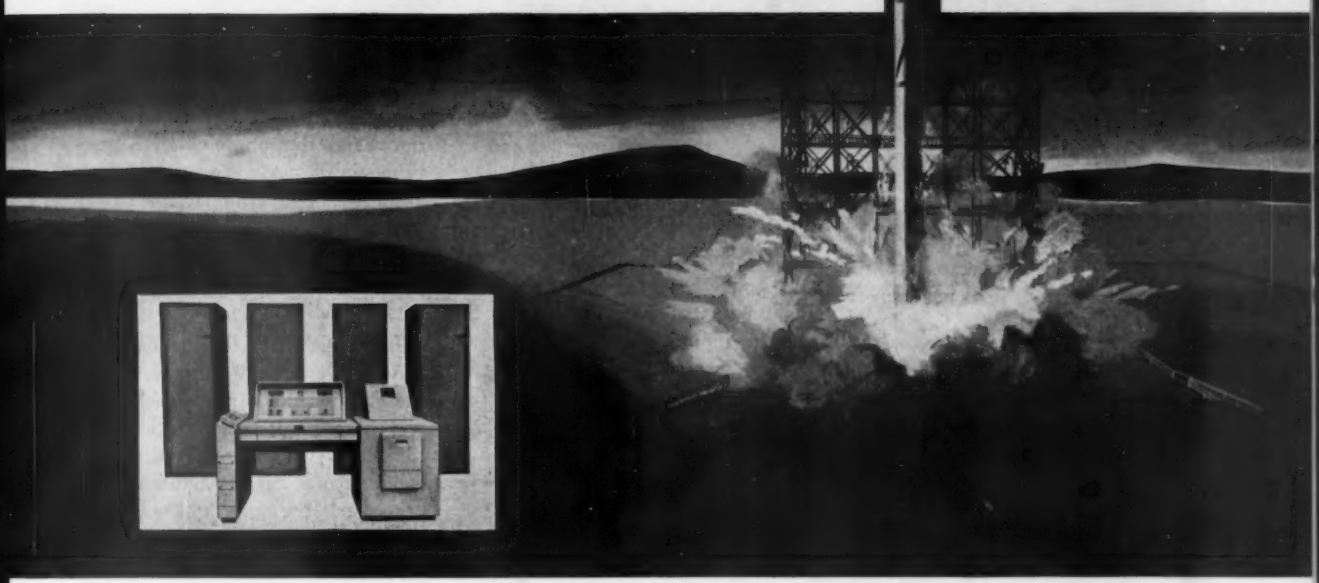

APCHE (Automatic Programmed Checkout Equipment) is a solid-state, universal, high-speed, highly reliable, compact general-purpose tester designed especially for automatic checkout of aircraft, missile and space systems and their supporting systems. In its various versions (differing in input media, size and weight) APCHE installations may be fixed, mobile, airborne or submarineborne. APCHE was designed and is being produced as a part of RCA's ground support electronics subcontract from the Convair (Astronautics) Division of General Dynamics Corporation, prime contractor for the ATLAS Intercontinental Ballistic Missile.

The system being supplied to Convair for the ATLAS Program includes a console and four rack cabinets providing both analog and discrete test functions with a resulting printed and GO-NO GO indication. As a product of RCA's Missile Electronics and Controls Department, Burlington, Massachusetts, APCHE is one of the latest RCA developments in the field of military weapon readiness equipments.

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cause higher-grade jobs are in the hands of Americans, KATUSAs, who are concentrated in rifle squads, make up the first line of defense.

A lieutenant reports that instead of a full complement of 236 men, his rifle company had only 15 GI's, two officers, 10 noncoms and 40 KATUSAs when he joined it a year ago. Now the ranks are up to more than half of full strength but a seasonal drop this fall is expected to decimate the group once again.

Some observers worry that the Koreans could prove to be difficult to command in any future fighting. Most of them understand little or no English, though interpreters of varying degrees of competence are available. And there's some concern about possible political problems.

The KATUSAs, everyone agrees, get along fine with American soldiers, though they keep pretty much to themselves. Training, however, presents some problems because of the language barriers. A lieutenant reports that the Koreans tend to doze during lectures, unable to follow.

"The KATUSAs don't shoot too well," says an American training officer at the reserve 7th Infantry Division between bursts of practice fire on a rifle range. Though many Koreans get along surprisingly well in combat maneuvers, another officer observes, many also get fouled up in mechanical things like simple repairs. "They're just not as inventive or ingenious as the American soldier," he says.

This is not to say that our Korean allies wouldn't fight hard or well for their country. But nearly every American military commander one questions says he doesn't think the Korean is nearly as effective in a U. S. division as the Yank he replaces.

KATUSAs are never given positions above American GI's. The Korean soldier joins a U. S. division for up to 18 months and gets only his regular monthly ROK army pay of about 1,200 hwan (some $2.40 at the official exchange rate). The U. S. also gives him a free monthly ration of cigarets, razor blades, shoe polish, candy, soap and chewing gum. They are housed, fed, and equipped the same as U. S. soldiers.

LIMITED WAR—A SIXTY-YEAR-OLD VIEW

In the summer of 1959 issue of *Military Affairs*, publication of the American Military Institute, Dr. Russell F. Weigley of the University of Pennsylvania discusses the "Military Thought of John M. Schofield," as the retired former commander of the U. S. Army and one-time Secretary of War developed it in testimony before the Senate Military Affairs Committee in 1902.

Gen. Schofield's thoughts about the nature of war and strategy have some meaning today, as Dr. Weigley makes clear in the following passages:

"While deploring war, [Gen. John M.] Schofield believed it necessary to prepare for war. 'What guarantee of peace with honor,' he asked, 'has the history of the world ever assured except preparation for war. . . [?]'

"If preparation were necessary, then it was necessary also to devote thought to the nature of war, so that preparation could be carried out rationally. Repeatedly Schofield emphasized the need to fight wars as reason dictated and not as passion decreed. Of the Civil War he said: 'It would seem that the official correspondence of that period ought to be a sufficient warning to deter any future generation from bringing the country into a condition where even some of the most distinguished citizens, statesmen, and soldiers seem to be governed more by passion than by reason in the conduct of public affairs.' Reason demanded especially a definition of the purpose of any war and the consequent adjustment of means to purpose. Unlike so many soldiers of his time, Schofield did not allow Clausewitzian catchphrases to usurp the place of his thought. He wrote at a time when the military minds of Europe were enamored increasingly of Clausewitz's doctrine of 'absolute war,' repeating increasingly the maxim that 'To introduce into the philosophy of war a principle of moderation would be an absurdity. War is an act of violence pushed to its utmost bounds.' Schofield did not agree. *He believed that limited wars had their place.*

"Strategy might have as its object, said Schofield, the destruction or capture of the enemy's armies; such is the case when the purpose of waging war is to suppress a rebellion, as in the Civil War, or to secure the total conquest of a foreign country. On the other hand, the purpose of waging war may be something less than total conquest, in which case the 'all-sufficient and hence best' strategy is simply that of 'defeating in battle or out-maneuvering the defending armies' without seeking their utter destruction. In the Civil War the worst strategy was a territorial strategy, since the purposes of the North could be achieved only through complete destruction of the fighting power of the Confederacy; but not all wars aim at the total conquest of the enemy, and accordingly a territorial strategy may sometimes be the appropriate strategy.

"The strategy of the soldier, then, is defined by the purposes of his war; and the purposes of war ought to receive their definition in turn not from the soldier but from the civilian heads of government. If the civil government prescribes a war of limited purposes, then it is the soldier's duty to adopt a limited strategy."

GENERAL OFFICER SHIFTS

Maj. Gen. DAVID H. BUCHANAN to Deputy TIG . . . Maj. Gen. GARRISON B. COVERDALE to 5th Region, USARADCOM . . . Maj. Gen. HOBART HEWETT to Sixth Army . . . Maj. Gen. ORLANDO C. TROXELL, JR., to Chief, Prov MAAG, Korea . . . Maj. Gen. THOMAS M. WATLINGTON to NSA . . . Brig. Gen. JOHN A. BERRY to 1st Inf Div . . . Brig. Gen. GEORGE A. CARVER to Eighth Army . . . Brig. Gen. CHARLES G. DODGE to Eighth Army . . . Brig. Gen. HARRISON A. GERHARDT to OCLL . . . Brig. Gen. JOHN A. SEITZ to Eighth Army . . . Brig. Gen. HOWARD M. SNYDER, JR., to Eighth Army . . . Brig. Gen. BERTON E. SPIVY, JR., to USAA&MC.

Retirements. Gen. CORTLANDT V. R. SCHUYLER . . . Lt. Gen. JOHN T. LEWIS . . . Maj. Gen. CYRUS A. DOLPH, III . . . Brig. Gen. JOSEPH M. COLBY . . . Brig. Gen. FRANCIS W. PRUITT.

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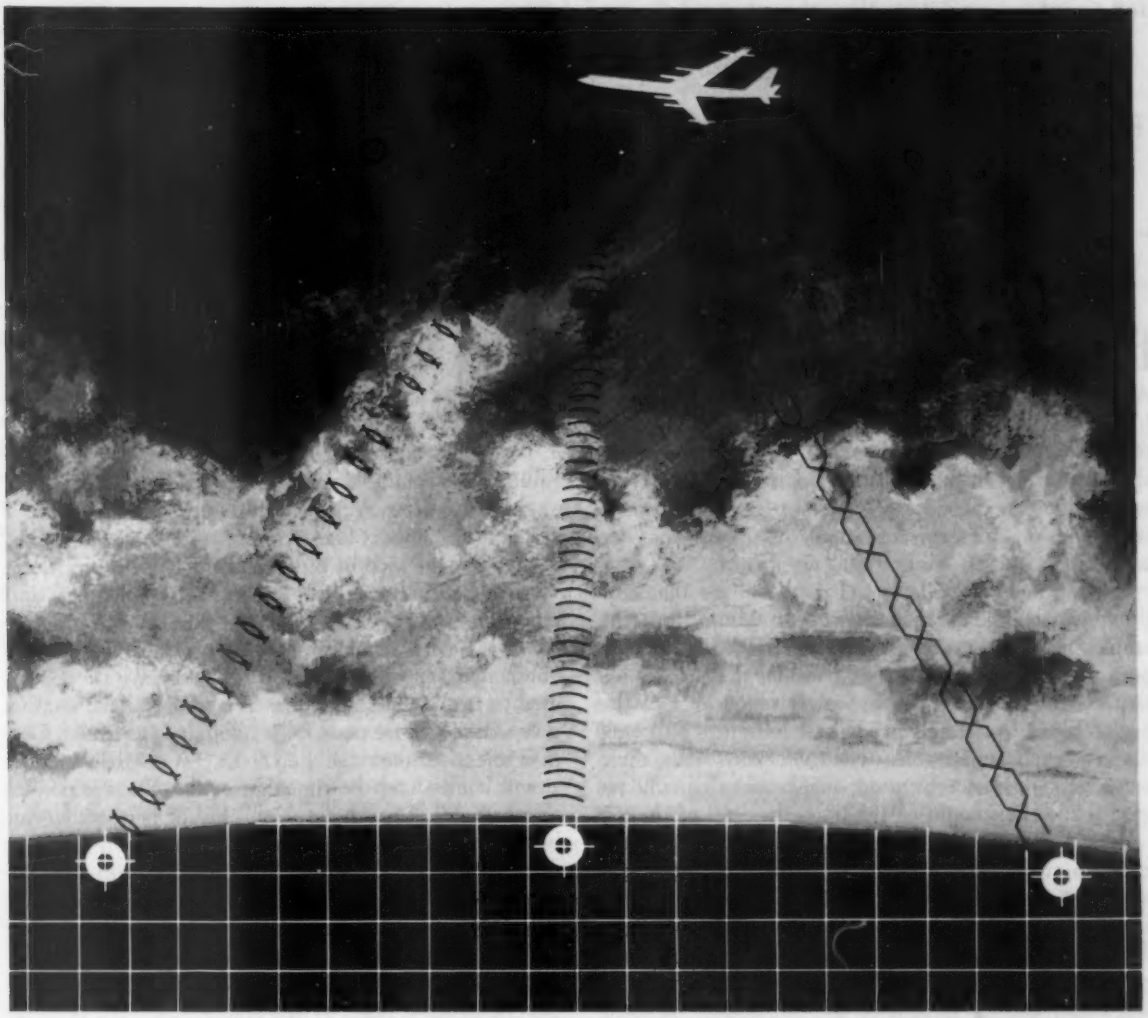

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Of all the uncertainties of future warfare none is more perplexing than whether nuclear weapons will be used, or should be used. Last month in "The Fallacy of a Dual Capability," Colonel Francis X. Bradley argued the case for a nuclear capability. Here the other side is argued just as persuasively.

The Other Side of the Atom

Colonel A. S. COLLINS, Jr.

IN this article I intend to argue that we in the Army should not let what George Kennan calls "the great American capacity for enthusiasm and self-hypnosis" blind us to the drawbacks inherent in the employment of nuclear weapons. I also want to suggest that we should not permit an unjustified optimism to carry us so far along in the development of concepts of operations and organizations of atomic weapons, that we cannot turn back if we find that we should.

Let me make myself clear. I don't believe that anything worthwhile or meaningful can result from the employment of nuclear weapons in war. In support of this premise let us first consider the responsible writers who question the wisdom or practicality of the use of tactical nuclear weapons. (I recognize full well that for each responsible writer who says that these weapons should not be used, many other equally responsible writers could be listed as advocates of them.)

These gentlemen bring considerable thought and logic to their writings—and very often if you turn back the pages you find them three or four years ahead of the pack in the suggestions they made in the political-military sphere. These thinkers and writers have disciplined their minds to look beyond the half-truths and the claims of the enthusiasts on each side of a debate. What they say helps dispel confusion. So let us not brush them aside too lightly. These gentlemen all say that no rational explanation has yet been put forward on just how tactical nuclear war will be kept limited—which is the overriding requirement in this type of military action. Surely, if these men remain unconvinced, the proponents of tactical nuclear weapons have not come forward with an adequate and convincing explanation of how the limitations will be imposed. Too often the fact that there are two sides to any fight is overlooked. It takes two to keep a limited war limited and it is just possible that our rules and our limitations may be unacceptable or misinterpreted by the other party in the conflict—or vice versa.

The non-selective weapon

Now let's look at this subject from the political-military viewpoint. At the strategic level our national strategy is defensive in nature and is based on a system of alliances. These commit us to assist our allies if they are the victims of aggression. Most often, then, we will be fighting on the homeland of our allies, and our objective will be to save that homeland. How can we do this with atomics if, as we know, a 14 KT weapon obliterated Hiroshima and 20 KT weapons are considered tactical atomic weapons? We seem to have lost our perspective and we need to be reminded—as the 18 German scientists reminded their countrymen—that "tactical atomic bombs have the same destructive effects as normal atomic bombs." Examples of this loss of perspective can be found in our military journals. In one such article, a situation was developed on a division attack in a highly developed and heavily populated area. This attack was supported by nine tactical nuclear weapons for a total of 395 KT. This did not include Air Force weapons nor did it include the weapons with which we must surely expect the enemy to retaliate. When one considers the devastation of the land areas in which this attack took place one should ask, "Just how selective or limited is this employment of atomic weapons?" And might not such a concept encourage our allies to be neutral and to tell us to stay home?

It appears to me that the proponents of tactical nuclear weapons have not explored just what we intend to accomplish with this weapon. The President has recently stated, "I don't know how you can free anything with nuclear weapons." Therefore we soldiers must keep reminding ourselves that the decision to employ nuclear weapons will be a political decision. Further, what might be limited nuclear war to us might be the nuclear holocaust in the area of conflict. So much has been written on this subject that there is no point in adding more to this part of the discussion.

So far I have been emphasizing that military power is an instrument of national policy and, since national policy has been in the direction of approving nuclear

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Colonel Arthur S. Collins, Jr., Infantry, is an occasional contributor who last wrote "What Are We Doing to Our Commanders?" in the January 1957 issue. After serving on the faculty of the Army War College, Colonel Collins is now with the U. S. Army Advisory Group, Korea.

operational and organizational concepts, one cannot be too critical of the man in uniform who emphasizes nuclear warfare. Given the American desire for powerful military force at as small a cost as possible and given the public emphasis on employment of nuclear weapons, the military planner could hardly have done otherwise. But it is time that all levels of responsibility give serious thought to the direction we are taking. I am disturbed primarily at the apparent unconcern of professional soldiers. The armed services of a nation are a reflection of that nation—and that is as it should be. But there are certain characteristics of the society which he is dedicated to defend that the professional soldier should try to divest himself of in his duty of furthering the national interest. Among these are his view of the hard realities of life when most segments of the society do not heed the danger signals. He feels that his objectivity must be and is of a high order. Yet when one looks at certain of the concepts for the employment of tactical nuclear weapons, one can wonder if George Kennan's observation that "the American people have an unqualified faculty for unjustified optimism" is not reflected in a lack of objectivity by military professionals.

Apart from the technical aspects of nuclear weapons employment, it appears that in the operational sphere, which is the soldier's bailiwick, we have found it convenient to ignore the implications of the effect nuclear weapons will have on military operations. We talk about what these weapons can do *for* us, but we seldom discuss what they can do *to* us. Too often one gets the impression that they are used in the best of all possible worlds—where we have them and the enemy does not.

As I stated at the outset, all but a very few military publications state positively and emphatically that the atomic weapon is the weapon of the future. Most of us say it will sweep all before it, and that the army geared to its use and capable of mobile, flexible, hard-hitting operations will dominate the battlefield of the future. But have we really looked at the nuclear battlefield? Do we know the nature of it? If one studies the information contained in Congressional reports on hearings on fallout hazards, it is apparent that a sudden shift in wind or a rainstorm creates many unexpected problems. If these problems occur under ideal conditions of a weapons test, visualize, for a moment, the effect that a number of these weapons would have on operations in the unpredictability and chaos of battle. Even if used unilaterally, which seems unlikely, the problems created for the user would be enormous. If one studies the host of problems that the atomic weapon brings to the battlefield—the blowdown, craters, contamination, flash blindness—then one can ask, is it really worth it?

"Can you beat him with them?"

Whenever these problems are discussed the proponent of tactical nuclear weapons will invariably say, "Well, do you think we can beat the so and so's without them?" And, of course, you must concede that, given current strengths and organizations, this is most unlikely. But one might also ask, "can you beat him with them?" There is one facet of this subject that the nuclear enthusiast tends to ignore and it is basic to the question. Almost anyone who has studied the effects of atomic weapons will admit that parity in numbers is not essential. There is a point at which enough is enough and an enemy can do just about as much damage to you as you can do to him even though he has a more limited stockpile. It is easy to understand those who advocate using nuclear weapons against an enemy with an overwhelming manpower advantage—if he does not have them. But I am unable to stretch my imagination to see the logic of insisting that a large conventional capability backed up with an adequate atomic capability is no match for a limited conventional capability backed up with more than enough nuclear weapons. More nuclear weapons do not necessarily spell victory. If an enemy does not have atomics it is no contest. When he does, little advantage seems to be gained by our use of them—particularly if he has more manpower to replace the losses that he will sustain.

In another context—suppose we fight an A-frame army that requires no large logistical installations and moves on its feet. Will not the modern force that we are creating with its complex missiles, and communications, and aerial supply systems be much more vulnerable to atomic attack than the enemy's foot-powered hordes? If you ask "where does this A-frame army get its atomic weapons?" I will reply that again the unilateral use of these weapons is not likely. In any case, this is not the situation which current concepts are designed to counter.

In this essay I have merely touched on high points of a very complex, difficult, and important issue. It needs much further thought, discussion, and study by military professionals—practitioners of the art of which it treats. It should not be left solely to civilian theoreticians or to service school study groups to develop solutions. It is important enough for each of us to participate. And when one reads the unclassified information available on this subject, security restrictions are of little hindrance. No fixed agenda is needed, since a host of considerations crowd to the fore: estimated casualty rates, weapons effects, national policy, and so on. I suggest that there is much superficial thinking on this subject—that our American enthusiasm for more gadgets and fewer men has carried us away and that there may be unjustified optimism in the belief that atomics are an easy way to victory. In this period of rapid technological change, all military men must consciously strive to keep their minds receptive to new ideas and new weapons. In so doing, we should avoid the acceptance of nuclear weapons as a "final" development. I refuse to concede that we can't beat the so and so's without them. We can if we have to and if we want to make the necessary sacrifice. It may well be that in the long run our national interest may be served best by such sacrifice.

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Cliff climbing with ropes is just one of many rigorous training practices of the U. S. Jungle Warfare Training Center that has its headquarters at Fort Sherman, C. Z.

In a "reaction test" a JWTC student on patrol suddenly comes on to the "bodies" of dead aggressors.

Class Room in the Jungle

Colonel ROBERT F. COCKLIN

THE importance of physical fitness and rigorous field training is too often minimized in this automation-mad era of missiles and machines. We tend to forget that more than one-third of the world's land area is covered by tropical jungle in which many of our most complicated weapons and equipments are useless. Some of the most sensitive potential trouble spots in the world are jungle areas. In such areas, success in battle depends almost entirely on the training and physical and mental stamina of the individual soldier.

Colonel Robert F. Cocklin, Artillery, USAR, is Advertising and Promotion Director of AUSA. During World War II he served with an infantry division in the Pacific Theater. This article resulted from a visit to the Jungle Warfare Training Center at Fort Sherman, C. Z.

Many U. S. fighting men went into World War II with little jungle training, and paid dearly for the lack. Physically unprepared for the rigors of fighting and existing in the jungle, fear of the unknown often shattered their fighting spirit. Lieutenant General Robert L. Eichelberger, who commanded our units in the desperate fighting at Buna, New Guinea, reflected on this in his book, *Our Jungle Road to Tokyo:*

"The first thing I found out was that troops in the front-line positions had no trustworthy knowledge of Japanese positions. Our patrols were dazed by the hazards of swamp and jungle; they were unwilling to undertake the patrolling which alone could safeguard their own interests. To get accurate information was almost impossible—and yet men die if orders are based on incorrect information.

"Actually this long after, I'm inclined to believe that the men were more frightened by the jungle than by the Japanese. It was the terror of the new and the unknown. There is nothing pleasant about sinking into a foul-smelling bog up to your knees. There is nothing pleasant about lying in a slit-trench half-submerged, while a tropical rain turns it into a river. Jungle night noises were strange to most Americans—and in the moist hot darkness the rustling of small animals in the bush was easily misinterpreted as the stealthy approach of the enemy." *[Italics added.]*

Good training for too few

Our Army hasn't forgotten these hard-won lessons, but are they receiving the emphasis they should? However, some really rugged and excellent jungle training is being conducted at our Jungle Warfare Training Center at Fort Sherman in the Panama Canal Zone. The numbers of troops being trained are woefully few, and many of those being trained are volunteers. Perhaps the degree of im-

Preparing a succulent fowl (above) are two officer-instructors at JWTC. Field cookery of edible jungle wild life is stressed during the training cycle. Center photo shows students lying in ambush, a tactical method that can pay off in jungle

portance the Army attaches to this type of training was best stated in the original assignment of the task to U. S. Army Caribbean which was given the mission of "keeping the art of jungle warfare alive." It's alive all right, but not nearly as flourishing as many who are alive to the realities of the current world situation think it should be.

JWTC, as the Jungle Warfare Training Center is popularly known, has a threefold mission: to conduct jungle warfare training; to develop and test jungle warfare doctrine and techniques; to test such equipment as may be requested by chiefs of the technical services, Department of the Army, and CONARC.

Since JWTC was organized in December, 1952, 11 infantry battalions, one artillery battalion, three infantry rifle companies, one mortar battery, three noncommissioned officer groups and one officer group have completed cycles of jungle warfare training. With its present strength and facilities, JWTC can comfortably handle about 300 men per cycle, and currently conducts seven cycles annually, largely for the Panama-based 20th Battle Group. There are two cycles for volunteer officers and noncommissioned officers from CONUS.

The current training program is realistic, rough, and to some degree hazardous. It is assumed that those who enter the school are well-trained in normal operations but have had no particular experience in the jungle. All training is conducted in the field. It includes evasion and escape techniques, jungle firing, communications and navigation, tactical and logistical operations as well as individual hygiene, sanitation, and living in the jungle.

One of several river-crossing methods taught at JWTC is the filling of a poncho with leaves, twigs and branches.

Realistic, rough and hazardous

Nature provides the classroom for this type of training. The Center occupies an area on the Atlantic side of the Zone some seven miles wide and twelve miles long. This strip is overgrown with almost every type of tropical and semitropical plant life. On its steep mountains and in its deep ravines one could expect to encounter all types of jungle inhabitants short of elephants, lions and tigers.

The wide, deep and fast-flowing Chagres and several other swollen jungle rivers criss cross the training area.

That portion of the cycle devoted to individual training does much to dispel the soldier's fear of the jungle as a natural enemy. He learns, among other things, all about the snakes and animals which may be found in the jungle. He finds that the jungle provides ample food and drinking water, and he has an opportunity to eat various indigenous plants and animals and learns the proper way to prepare them. Not many swank hotel menus list boa constrictor and iguana, but to

warfare. Photo on right shows a student crossing the Indio river on a two-strand rope bridge. This is only one of several methods of traversing rivers that are taught. Photos with this story show only the highlights of the intensive training.

a hungry soldier in the jungle they are a fair substitute for filet mignon. The slogan for this class is "If you haven't tried it, don't knock it."

Perhaps the greatest fear that soldiers—largely city-bred—bring to this course is the dread of snakes. To be sure, the jungle has more than its share of repulsive and deadly snakes. The eyelash viper, the fer-de-lance and the awesome bushmaster are three of the most poisonous. However, during the seven years the Center has been operating, the only cases of snake bite have occurred among instructors who became careless in handling snakes during instruction periods. (See box on treatment of snake bite.) During training the soldier soon learns that snakes will avoid humans if at all possible.

Part of JWTC's mission is the testing of equipment. It has tested lightweight poplin jungle uniforms, new combat packs, all-purpose stretch socks, a new general-purpose tent, a carrying strap to replace the old wooden packboard, a camouflage dye for web equipment, and paper knit sandbags. Likewise, JWTC is on the alert for new ideas for better jungle equipment. This is Major W. A. Dixon, the current CO of JWTC, modeling an experimental jungle suit which he designed and which was made up for him by his wife. Made of Fiberglas screening, it is designed to withstand the deleterious effects of heat and dampness, repel insects, and at the same time provide a free-flow of ventilation to offset the steady flow of perspiration induced by the heat and humidity of the jungle. The Quartermaster General has accepted Dixon's handiwork as an official experimental uniform.

Heat, hygiene and hiking

Individual training also stresses essential personal hygiene, the effects of heat, and practical work in jungle living. Students are required to erect semipermanent jungle shelters and to cook a meal of a chicken which they have killed and dressed themselves, along with rice or a potato substitute which they must prepare.

To the untrained, getting around in the jungle is most difficult and sometimes hazardous. Fourteen hours of the training schedule are devoted to hiking in the jungle, starting with a review of basic map reading and the use of the compass (still, at this late date, one of the weak points in our basic training). After three-man teams negotiate a daylight jungle navigation course, six hours are devoted to training in night navigation, culminating in the teams negotiating an 850-yard compass course at night. This is no easy trick in the thick undergrowth where no trails exist. Frequently, it takes 12 hours or more for all to find their way out.

To many, the necessity of hacking

JWTC students skin a boa.

DON'T CUT THAT SNAKE BITE

For years, the accepted method of on-the-spot treatment of snake bite called for applying a tight tourniquet between the bitten area and the heart, making an incision between the points penetrated by the fangs, and then either sucking or by artificial means drawing out the poison. Jungle experts and medics now say this method is both outdated and dangerous. The recommended treatment calls for applying the tourniquet between the bite and the heart but only tight enough so that a slight pulse can be felt below the tourniquet. *Do not make an incision* but suck out the poison from the fang perforations. Sucking by mouth is considered far more effective than any artificial method. If the tourniquet is applied properly it need not be loosened from time to time. The medics point out that incision only enhances the spread of poison, increases bleeding, and must be avoided. The bitten area must be kept as cool as possible and the patient must remain inactive and quiet.

a trail through the jungle growth with a machete would be difficult enough. Actually, rivers and cliffs are more formidable obstacles to be overcome in jungle operations. Some eight hours of training are devoted to discussion, demonstration and practical work in expedient devices for negotiating these obstacles. The student learns how to scale a cliff by use of the body rappel. The use of single- and double-strand rope bridges is explained and demonstrated. One of the most hair-raising parts of the schedule is the rope traverse across the wide, deep and fast-flowing Chagres River. The starting point is high in a tree on one side of the river, and the student must reach a point about 350 yards on the other side. Using a pulley and underarm rope sling, students zoom across the Chagres with more than a little trepidation on the first trip, but like a first ride on a roller coaster they line up more readily for a second. After each candidate has completed practicing these techniques, he is required to construct a brush raft and to cross the Chagres by this means.

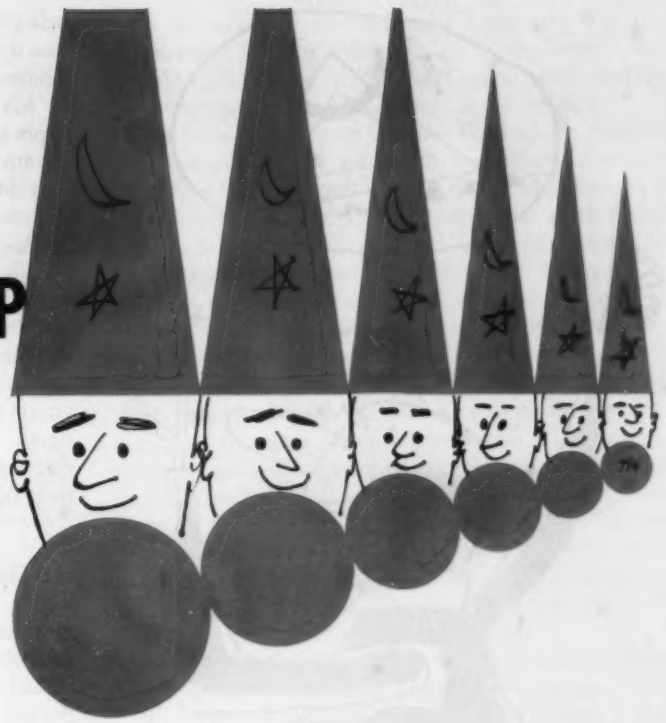
The combat portion of the schedule includes transition, squad, and quick firing; reconnaissance and combat patrolling; ambush and counterambush, evasion, and escape; attack and defense; raid tactics, and adjustment of artillery fire.

Conquering the unknown

This is but a brief sketch of some of the most rugged and realistic training being conducted anywhere in our Army. Not only does it teach the soldier the essential rudiments of living and fighting in the jungle, but also instills in him a confidence born of conquering fear of the unknown. Interviewing a cross-section of graduates, one finds not only pride of accomplishment but enthusiasm for the opportunity to participate in training so directly associated with difficult battle conditions. Indeed, its graduates are the best salesmen for JWTC.

Considering the potential trouble areas in the world today, jungle warfare training deserves more emphasis than it is currently receiving in our Army. Certainly JWTC has more than adequate facilities. Trained instructors are available, and with proper recognition from CONARC and the Department of the Army, jungle warfare training could and should be materially expanded.

CONCEPTMANSHIP



How to be a military prophet

ROBERT B. KIMBLE

CLOSE on the heels of Phase I of Korea, an epidemic of head-nodding and eye-winking spread through the strongholds of the military with a swiftness unsurpassed even by the Asiatic flu. It was to be witnessed in the District of Columbia, in Kansas, in Pennsylvania, and many other places, reaching its daily apogee during the brown hour from 1600 to 1700.

"Now don't tell me what's doing in Korea!" is representative of this period. "Forget about Korea. It's a throwback to some other era. Completely untypical of modern tactics. It has no meaning for future ground operations."

Key word in these remarks is, of course, *future*.

What I have to say is addressed to part-time practitioners of the art of military prophecy—to the occasional grinder-outer of "future concepts." To the pros, daily laboring deep in the bowels of a soundproof puzzle palace on the endless modification and projection of concepts, it will be useless. It is intended merely as a hip-pocket guide to the modes and tools of an inexact science—conceptmanship.

If you just want to play the averages, the safest prediction would be to string along with the idea that we should let militaristic nations develop military concepts; that we should wait until we find ourselves in a war. You let the enemy demonstrate the new tactics, and then act accordingly. If, with this philosophy, you had bet on every war in which we have been engaged with a foreign power, you would have made money six times out of seven. (You'd have lost on the Revolution.)

Akin to this is the technique of constructing mathematical models of all the tactical situations you can think of. This method—generally known as opsearch—eventually will provide you with a tubful of likelihoods covering ten thousand eventualities. Such quantitative analysis can, for example, gauge for a football coach the effect in a given situation of ten extra pounds on his line-backers. Still, there is an aura of unreality about it all. Johns Hopkins University has an Operations Research Office. Hampden-Sydney College doesn't. Yet the Johns Hopkins football team still has one hell of a time beating Hampden-Sydney!

No, playing the averages might improve your mathematics, but it won't make you a prophet. Witness Freiherr Dietrich von Bülow. Bülow pondered deeply on how to get the most out of one's military assets and in 1806 published his *Spirit of the Modern System of War* in which he announced his Law of the Obtuse Triangle. Bülow's Law—guaranteed to insure the security of one's supply lines, if nothing else—was

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Robert B. Kimble is a Project Officer on the U.S. Army Signal Board and is on the staff of the Chief Signal Officer's Steering Committee for Concept Development. He was educated at Charlotte Hall Military Academy and Western Maryland College.

In 1806 came the Law of the Obtuse Triangle

predicated on a trigonometric concept of politico-military space. From one's Base of Operations (a line running parallel to the front) there should be extended from each end two Lines of Operation. The Lines of Operation should converge on the enemy at an angle of at least 90 degrees. Any offensive maneuver should move not more than three days' march from the base line. Despite the fact that his Law was never adequately field-tested, Bülow was adjudged insane, proved sane, jailed by his Prussian compatriots, and in 1807 died in a Russian prison.

The rule of three

Bülow's theories and formulas are mindful of one of the oldest rules of thumb: a change in organization is justified by the introduction of three articles of equipment having no previous counterpart, or by the substantial improvement of 10 existing pieces. In other words, your current organization and doctrine have withstood the test of time; make do with them until new equipment forces you to change them.

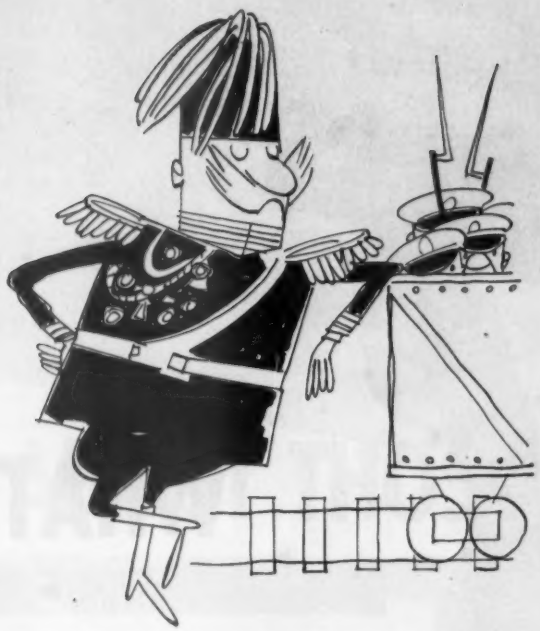
Count Alfred von Schlieffen, of Franco-Prussian War fame, loathed the old rules of thumb because he believed them to be based on the dubious assumption that there is no new thing under the sun. The growing momentum of technology intrigued him and suggested to him that immediately ahead lay undreamed of applications of science to war. He developed a conviction that military forces should adapt themselves to technological advances, rather than the reverse. Over the inevitable and concerted opposition of the boys in black—the conservatives—he consistently and systematically modified the German Army in every way necessary to permit it to seize the great mobility offered: first by the railroad and, shortly after, by the motor vehicle and the airplane. He succeeded in creating mobile heavy artillery, military railway engineers, and an air arm. He failed to win approval, however, for a signal corps, so German commanders consequently discovered that they were unable to exploit effectively their new firepower and mobility.

Galloping pollsters

A simple device for becoming a prophet—particularly if you are handicapped by a retarded imagination—is to collect and collate the ideas of others. While on the surface this might seem to be of dubious propriety, actually it has become quite respectable in our society. An old pro among prophets of this type was Colonel Ardant du Picq, who drafted up a questionnaire and circulated it among the officers of the French Army. The results of du Picq's attempt at mass brain-picking were something less than he had hoped for. This led him to give the back of his hand to his contemporaries and he turned to the writings of ancient Greek and Roman commanders who were much less reticent in revealing the secrets of their trade. Since du Picq's time, however, the art of asking questions (and obtaining the right answers) has developed considerably. Today there are countless expert pollsters whose services can be easily obtained or whose techniques can be successfully emulated. Field Marshal Wilhelm von Leeb once complained that the "very variety of opinion" proves how difficult it is to conceive a picture of future war. With the techniques of a modern pollster, von Leeb's difficulty could be turned into an opportunity.

The close-cropped approach

Another old pro was the irrepressible Karl von Clausewitz, whose tome *On War* is often quoted but seldom read, being—as one commentator put it—the Holy Scriptures of the modern military man. Clausewitz's method can be stated simply: intensive analysis of a few selected situations is a better basis for projecting future tactics than extensive surveys of a great variety of battles. Clausewitz explained his close-cropped approach to concept development in these words: "As many plants only bear fruit if their stems do not shoot too high, so in the practical arts the theoretical leaves and blossoms must not be allowed to grow too high, but must be kept close to experience, their proper soil."



Rail lines of communication, but no signal corps

Hans Delbrück, editor, scholar and writer, reversed Clausewitz's dictum and produced as a consequence his *History of the Art of War*, a monument to extensive, in contrast to intensive, analysis. But naturally enough, rather than shedding much light on future tactical concepts, his research carried him into the rarefied atmosphere of politico-military relations. Here, again naturally enough, he felt impelled to take sides. Unfortunately, his timing was extremely bad, for he chose to expound his preachings just when Kaiser Wilhelm II was trying to subdue the Allies and he ended up alienating the very military leaders he had hoped to influence. Throughout Germany's participation in World War I, Delbrück persisted in criticizing and needling the High Command in his monthly column in *Der Preussische Jahrbücher* and, at the war's end, he was able to proclaim—to the annoyance of many—"I told you so!"

Delbrück's example lights the way for him who yearns to be a gadfly. But Delbrück's methods inevitably led him far afield from concept development and hence stand as a warning to the budding concepteer.

The Fuller brush men

Apprentice prophets chilled by the prospect of becoming a Bülow or a Delbrück would do well to seek their journeymanship in the manner of Major General J. F. C. Fuller, British prophet of renown. Fuller, top tanker of World War I, had his imagination triggered by the awful potentialities of mechanized armor. Aided by a facile pen, he launched a mounting barrage on all conventional concepts of war. He conceived amphibious invasions by massed armor and foresaw battle areas governed by the tank and supporting aircraft. Relentlessly he beat the brush for those "asses" who "would rather have refuse than gold," and steadily enlisting open-minded youngsters in his crusade.

His prize convert was Captain Basil Henry Liddell Hart, already in his own right an influential writer on military subjects and a brush-beater of tremendous potentiality. Liddell Hart, who soon became the poor man's Clausewitz, possessed the knack of looking at an engagement—recent or ancient—and seeing in it novel possibilities for today. For example, Fuller had conceived the idea of deep *tactical* penetrations by armor. Liddell Hart, looking back 700 years at Mongol operations and the swift and lengthy incisions made by their cavalry, developed Fuller's concept further and conceived the deep *strategic* penetration. He attracted much attention by persuading the Chief of the Imperial General Staff to create an experimental armored force designed to operate "on modern Mongol lines." Some firebrands in the U.S. Army took notice, and in 1931 established a Mechanized Force which survived nearly three exciting months of onslaught before the Old Guard succeeded in having it disbanded.

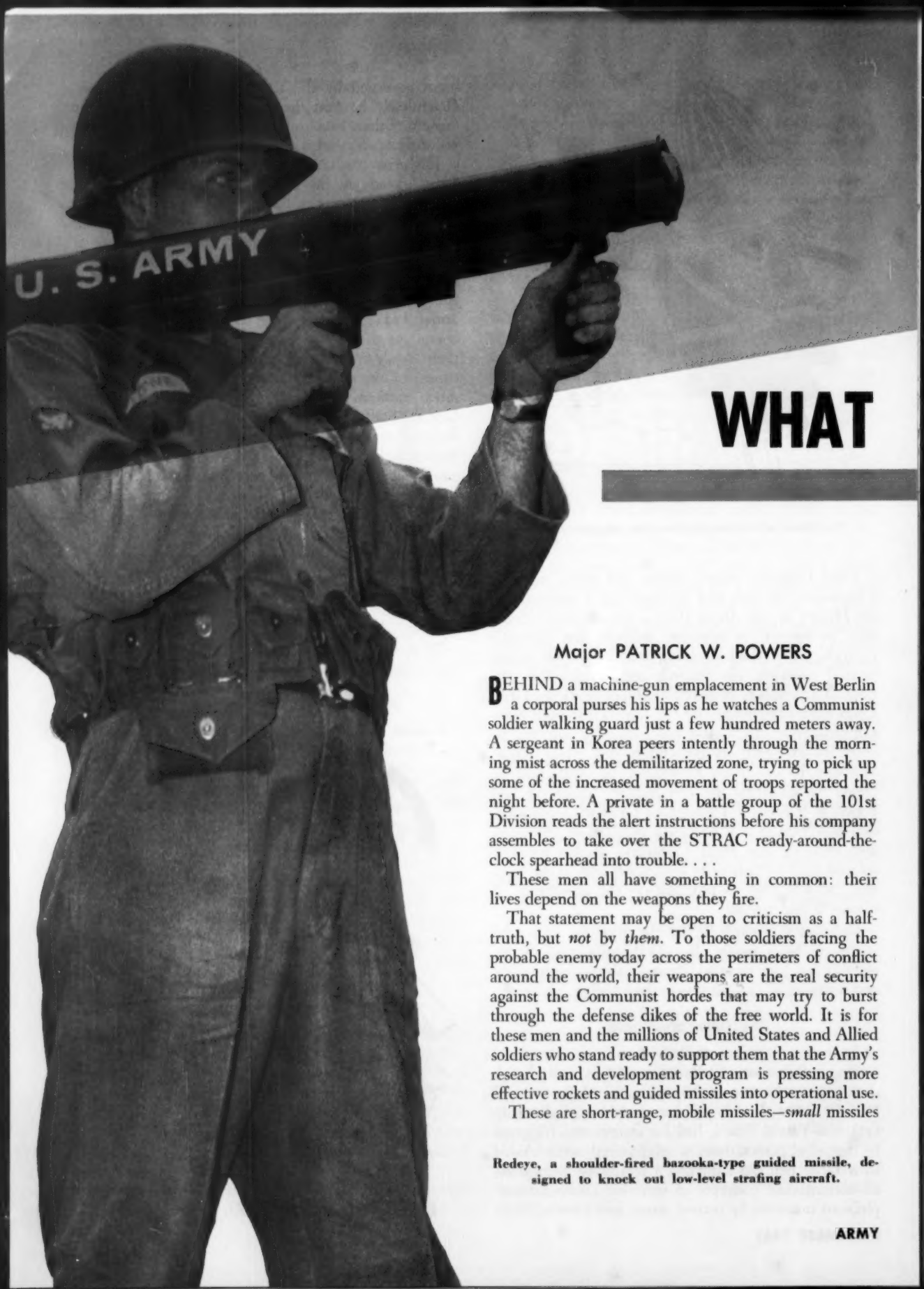
In Germany, Heinz Guderian, closely following the activities of Fuller, Liddell Hart & Company, in 1935 sold their concept to Hitler with a slight change in the brand name from "expanding torrent" to "Blitzkrieg."

The technique

What is the trade secret of these British renowns who revolutionized modern warfare even before the

(Continued on page 52)

A wealth of novel ideas in the methods of the ancients



WHAT

Major PATRICK W. POWERS

BEHIND a machine-gun emplacement in West Berlin a corporal purses his lips as he watches a Communist soldier walking guard just a few hundred meters away. A sergeant in Korea peers intently through the morning mist across the demilitarized zone, trying to pick up some of the increased movement of troops reported the night before. A private in a battle group of the 101st Division reads the alert instructions before his company assembles to take over the STRAC ready-around-the-clock spearhead into trouble. . . .

These men all have something in common: their lives depend on the weapons they fire.

That statement may be open to criticism as a half-truth, but *not* by *them*. To those soldiers facing the probable enemy today across the perimeters of conflict around the world, their weapons are the real security against the Communist hordes that may try to burst through the defense dikes of the free world. It is for these men and the millions of United States and Allied soldiers who stand ready to support them that the Army's research and development program is pressing more effective rockets and guided missiles into operational use.

These are short-range, mobile missiles—*small* missiles

Redeye, a shoulder-fired bazooka-type guided missile, designed to knock out low-level strafing aircraft.

SS-11 antitank guided missile, contains a warhead which can destroy any known tank. The small (63 pounds) missile can be launched from surface or air and has a range of two miles.

ABOUT THOSE SMALL MISSILES?

—not the big intercontinental monsters that capture the headlines as they thunder into space over the Atlantic and Pacific. To the Army, the missile race is just as vital at this level as it is at the ICBM plateau because the threat is an 8-million-man Sino-Soviet army loaded with 50,000 tanks and tens of thousands of tactical aircraft. If and when this force is committed, piecemeal or in great chunks, our soldiers must have the firepower to meet the attack and whittle it down to size. Any new weapons integrated into our stock of weapons must be accurate, lethal and mobile enough to match the concepts of the fluid, modern battlefield. We are staking our future on quality, not quantity, just as the Germans did when they defeated the Soviets early in World War II, although outnumbered three to one.

To meet the requirements of the future, some ten guided missiles and rockets are being developed for operational use within the division. These weapons are designed to give direct support and general support to the forward edge of the battle area as well as antitank and air defense. Furthermore, each weapon can be used in any scale of war, be airlifted into a remote trouble spot and then moved by the division's own ground and air vehicles *within* the battle area.

What are these new weapons? What about their capabilities and characteristics? A closer examination of this firepower spectrum within the division provides an interesting insight into combat operations for the next few years. Every soldier should be concerned—either directly or indirectly—with this part of the Army's principal mission.

Direct Support Missiles

The new direct support weapon is Missile A. It will have the task of executing the fires requested by the front-line infantry units of the division. This unguided rocket satisfies the general requirements of increased lethality of munitions, and increased mobility.

Missile A will be the 105 of missiles. Think about the versatile 105mm howitzer and its record of close support for the doughboy and you have the future Missile A, plus a few added extras: reduction of weight by an 8 to 1 ratio over anything comparable today; choice of warheads; really simple design with a solid propellant rocket engine; and the capability of being

Lacrosse, highly accurate one-ton missile, can deliver atomic, shaped-charge or conventional high explosives against enemy ground troops.

The mobility of Honest John is demonstrated by a Mojave (H-37) helicopter which is shown transporting the 6,000-pound workhorse of the atomic battlefield.

pushed, trucked, lifted, flown or dragged anywhere on the battlefield.

Units like STRAC will use it. The battle group will have it in direct support of its companies. There will be little maintenance required (much less than any howitzer) and yet Missile A is designed to be as reliable and rugged as any of its predecessors.

General Support Missiles

The general-support weapons include four rockets and missiles, two of which are improved versions of those already in use by Army units. All are designed to support the division's over-all operations or give special-purpose fire support as required.

An improved Honest John is in the final stages of development. This new solid propellant rocket with no guidance system will be more accurate and have greater range than its predecessor. One of the biggest improvements for this reliable workhorse of the atomic battlefield is in its mobility. The Southern European Task Force (SETAF) recently demonstrated Honest John's versatility when it flew the rocket and its supporting equipment from Italy to Salonika, Greece. Under simulated combat conditions the crew fired it, hitting the hillside target dead center—the total operation in the space of six and a half hours! A new self-propelled launcher is expected to reduce that time during strategic movements; a lightweight, helicopter-transportable launcher will also speed up long-range air transfers as well as insuring faster scoot-and-shoot tactics within the battle area.

For some time Little John has been with the 101st Airborne Division for training and development of combat techniques. The final version of this 800-pound, 14-foot rocket will be rotated mechanically on its launcher before it is fired to impart a slow spin to overcome thrust misalignment, which affects accuracy. Like Honest John it carries either atomic or conventional warheads but because of the rocket's lighter weight and its handling equipment it is especially suited for STRAC and airborne operations. Its range compares with that of medium and heavy artillery.

In this general support class, Missile B is planned to be the 155 of rocket and missile fire support. Though it is still in the early planning stages, the latest advances in rocketry will be used to retain the simplicity, reliability and mobility required for the division's combat area.

Lacrosse will be able to deliver atomic shaped-charge or conventional high-explosive warheads against enemy troops in the open or protected by pillboxes and bunkers. This 19-foot, one-ton-plus weapon is launched from a conventional 2½-ton truck some distance behind the forward edge of the battle area. The position of the truck is known to an observer with the guidance equipment located among the forward troop elements, say opposite an enemy bunker. The guidance equipment consists of an angular tracker computer, range and direction indicator, and power supply. A target-ranging set may also be employed to pinpoint target location. The guidance system sends commands to the missile

The reliable Honest John, solid-propellant, free-flight rocket, is launched. An improved Honest John, almost ready, will be more accurate and have greater range.

Major Patrick W. Powers, Artillery, now on duty in the Office of the Army's Chief of Research and Development, has been active in the missile field since 1950. A 1945 graduate of West Point, Major Powers has been an instructor at the Antiaircraft and Guided Missiles Branch of The Artillery School (now the Air Defense School), and served with one of the Army's missile units. He has written many articles on missiles for ARMY. This one brings up to date the series he began in 1952, "Soldier's Guide to Guided Missiles."

DIVISIONAL ROCKETS AND MISSILES OF THE FUTURE

MISSION	ROCKET-MISSILE	CHARACTERISTICS
DIRECT SUPPORT	MISSILE A	105 of missiles; mobile; simple
GENERAL SUPPORT	HONEST JOHN (Improved)	More range, better accuracy, more mobility; atomic-conventional warhead
	LITTLE JOHN (Improved)	Shorter range but better accuracy, more mobility than Honest John; atomic-conventional warhead
	MISSILE B	155 of missiles; simple
	LACROSSE	Extremely accurate; atomic-conventional, shaped-charge warhead
ANTITANK	SS-11	Small; lightweight; simple; fired from ground, vehicles or aircraft
	SHILLELAGH	Advanced design; simple; accurate; lightweight
	ROCKET GRENADE	Expendable container-launcher; all-arms weapon
AIR DEFENSE	REDEYE	For strafing attacks; simple; all-arms weapon
	MAULER	All-weather guided missile system; SP, launcher

as it comes overhead, directing it into a steep dive onto the bunker. The most recent tests have demonstrated high accuracy and suitable reliability for this weapon.

The Lacrosse system represents a major improvement in the design of a special-purpose weapon which can accurately attack the type of small, hard targets that so many times held up the advance of our forces in World War II and in Korea. It has the mobility of a truck and the reduced field handling characteristics of the solid-propellant rocket. All its launching equipment is carried on the truck that mounts the missile. Checkout of the missile is automatic, by a sequential type checker on the truck. The forward guidance equipment can be man-packed into any type of terrain. All these characteristics insure a rapid, accurate, and effective engagement of the type of ground targets that always confront the division.

Antitank Missiles

The antitank problem has always been a tough one to solve but a missile seems to be the best answer. The urgency is obvious: the red silhouettes of some 20 mechanized-armored divisions containing a potential of 8,500 heavy tanks loom on the free world's horizon. The present jet-propelled candidates heading the ticket for this mission are the SS-11, Shillelagh, and a rocket grenade.

SS-11 is a French-designed missile being tested for adoption on an interim basis, until more advanced systems can be developed. SS-11 is guided optically to the target by an operator who sends electrical guidance signals over wires that are trailed behind the missile. It is a small (63 pounds), solid-propellant missile with a warhead of sufficient size to knock out any known

Little John, with a launch weight of 800 pounds, is extremely mobile on the ground and is easily air-lifted. An improved version of Little John is in development.

tank. A distinct advantage of this lightweight weapon is that it can be launched from the ground, a truck, a tank, from a helicopter or other aircraft. Once launched, it has sufficient velocity to be relatively safe from rifle, machine-gun and antiaircraft fire with a high probability that a single round will destroy the target. SS-11 operates much like SS-10 (already adopted by the Army) but has twice the range (two miles), and a greater speed and kill probability. It is being evaluated as a complementary missile to SS-10.

Shillelagh is being developed as a lightweight combat vehicle weapon system which will greatly increase the hit-and-kill probability against armor as well as troops and field fortifications This type of weapon is designed to destroy moving tanks beyond the effective range of their own guns.

What about the rifleman who is confronted by enemy armor? Will he have any new weapon that can defeat a tank? A rocket grenade is under development to satisfy that need. This weapon is essentially an adaptation of a rocket engine to the rifle grenade's high explosive antitank (HEAT) warhead so that it can be launched from a combination expendable launcher and packing container. This arrangement increases the grenade's accuracy and range; the total weight is designed to be less than four pounds.

Divisional Air Defense Missiles

The air defense of the division is of great concern to the Army. While most of the emphasis has been placed on larger missile systems for the air defense of large areas, ground forces in contact with the enemy are especially vulnerable to attack because of the extremely short reaction time. These attacks can come from supersonic fighter-bombers or just as effectively from slow, 200-knot light aircraft, flying platforms, or even from armed helicopters.

Redeye is designed to meet this low-level strafing attack. It is a shoulder-fired, bazooka-type guided missile that can be carried along with any of the division troops. This weapon is approximately 4 feet long, 3 inches in diameter, and weighs approximately 20 pounds. A simple guidance system combined with a one-shot, container-launcher insures minimum maintenance problems while providing increased effectiveness over conventional air-defense guns.

Mauler is an air-defense guided missile system that may be attached to the division. This all-weather missile will be developed to protect the soldier from the strafing threat. It will be highly mobile, self-propelled, and have a high kill probability. It will defend columns on the move or units in position on the battlefield.

More than a twofold increase

While this is the era of the ballistic missile with the intercontinental range, public attention is now being focused on the probability of limited conflicts waged under the umbrella of the big nuclear threat. A realistic appraisal of this situation indicates that there will be more smaller wars in a continuous pattern so far as we can see into the future. The Communists have mustered ground forces out of proportion to their present military commitments, and as General Taylor said recently, "The size of the Soviet Army suggests to me that they anticipate a great advantage in a period of mutual deterrence when both sides have about equal atomic strength."

Our divisional and smaller units must have the benefit of tactical integrity to fight their own isolated battles on the dispersed battlefield. They must have effective new weapons to meet the massed enemy assault that may be launched against them. As a result, the Army is accelerating development of Missiles A and B; Honest John and Little John are improved; Lacrosse, Shillelagh, SS-11, a rocket grenade and Redeye are either in production or under development; and Mauler may be developed in the future. Only two years ago there were only four such weapons in this research and development program. Today's more than twofold increase testifies to the rapid advances in science and technology and the increasing requirements of our tactical concepts against the predicted enemy threat.

Combat power has more dimensions than mere superiority in numbers. Accurate, lethal and mobile weapons in the hands of the tough, front-line fighter are a startling equalizer on any battlefield, in any time frame. In 1965 *you* may be in an outpost somewhere on this planet. Look about you; know your new rockets and missiles. Your life—and the lives of the soldiers around you—depends on these weapons.

MISSILES OF OTHER NATIONS OF THE FREE WORLD

Captain JONATHAN L. HOLMAN

Other free-world nations are coming up with missiles that will augment those of the United States, long the front-runner in free-world missile development. The missile capabilities of these nations must be considered in measuring the relative strength of the communist and free worlds.

WHEN guided missile inventories are assessed, we are inclined to compare the U. S. missile arsenal to Soviet missiles—and stop right there. Until a year or so ago, this was a fair summary of the situation. Today, however, this is an incomplete summation and in the future it will become even more incomplete. All the major countries of the free world are in the process of arming themselves with missiles.

A surprisingly large amount of independent work in missile research and development has been done in Europe. This work is beginning to pay off in terms of operational systems.

Post-Sputnik America is aware that we do not lead in all phases of guided missile development. Even where we do lead, we are being technically challenged from day to day by missile developments abroad. Therefore it's prudent to keep a weather eye on these developments. The actual and potential missile capability of all the free world powers is important to us and must be considered in any assessment of the relative strength of the free and Communist worlds.

Captain Jonathan L. Holman, Jr., Artillery, a 1951 graduate of the Military Academy, served with the 780th Field Artillery in Korea. After attending the University of Southern California in 1956 under the Army's civil school program, he was assigned to the U. S. Army Air Defense School, where he recently completed a three-year tour as instructor in the Nuclear Weapons and Guided Missile Orientation Course.

Artist sketches of missiles mentioned in this article appear on the two following pages

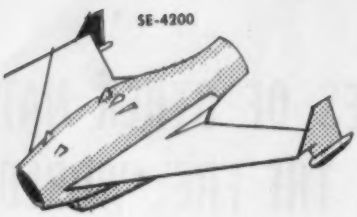
United Kingdom missiles

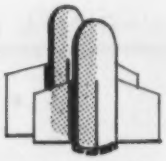
Outside the United States, but within the NATO alliance, the United Kingdom has the most extensive program of missile development and production. The Ministry of Supply is responsible for research, development, and production of aircraft and guided missiles for all three services. It is also responsible for many other weapons and equipment for the Army and Air Force. Although a civilian agency of Cabinet rank, the Ministry performs many functions for the British armed forces which are done in this country by our technical services. It administers a number of research and development centers and places appropriate weapons development and production contracts in industry. (In fields other than aircraft and guided missiles, the Admiralty operates its own research, development, and production facilities for ships and naval equipment.)

For several years, the Ministry of Supply has been developing the Sea Slug surface-to-air systems for the Royal Navy. This is the first operational naval missile, designed specifically for fleet air defense, arming the *Hampshire* class of guided missile ship. The British are constructing four vessels for Sea Slug. The Royal Navy chose the beam-rider type of guidance for this missile, a choice consistent with that of the U. S. Navy's first surface-to-air missile, Terrier. Sea Slug uses two stages of solid propellant engines in a standard booster sustainer thrust combination.

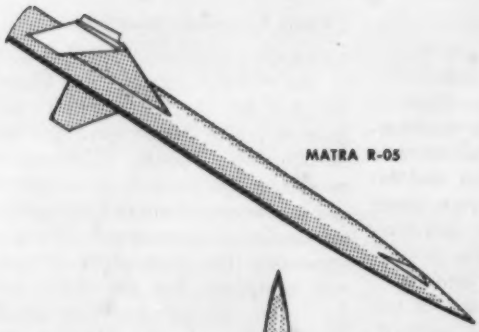
(Continued on page 38)

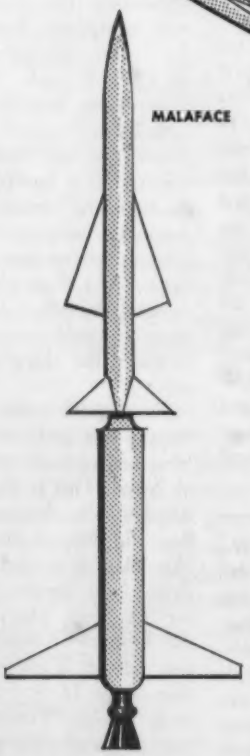
Missiles of Other



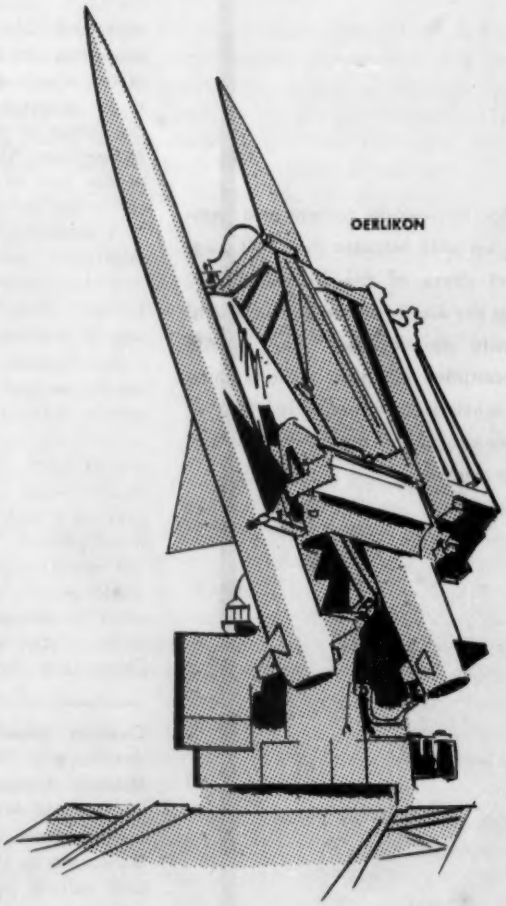


SS-11 and SS-10



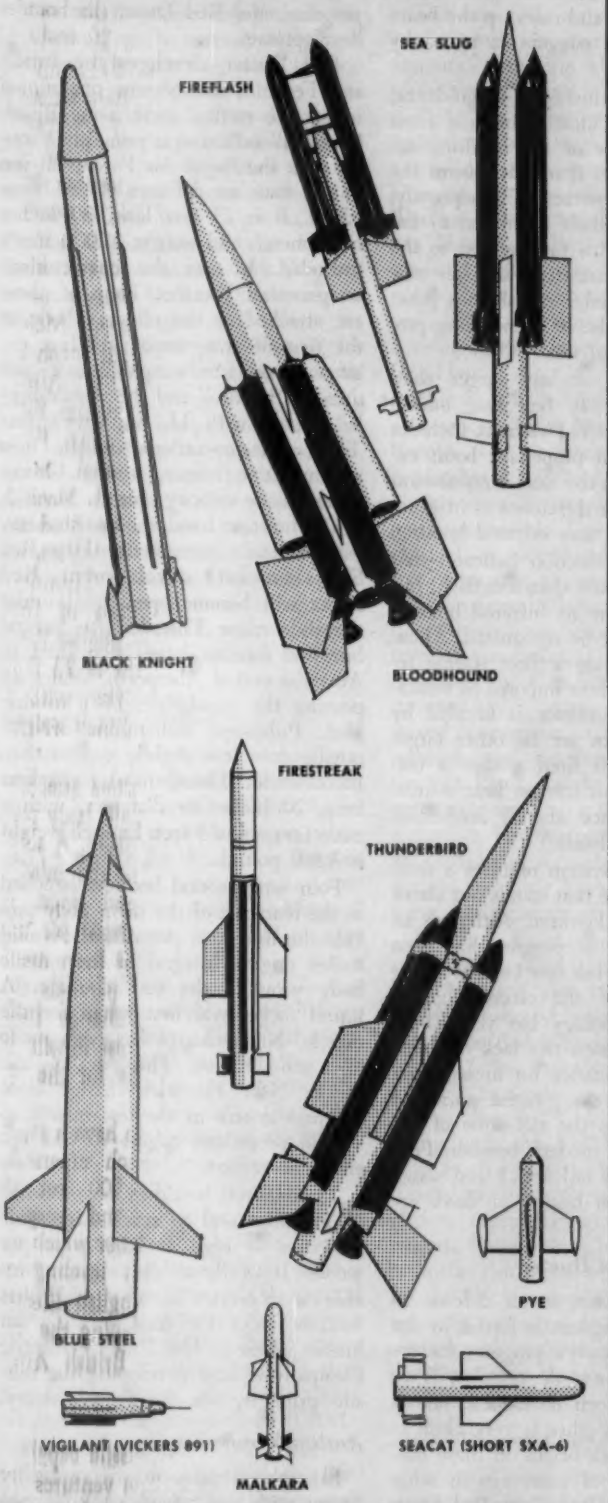


FRENCH MISSILES

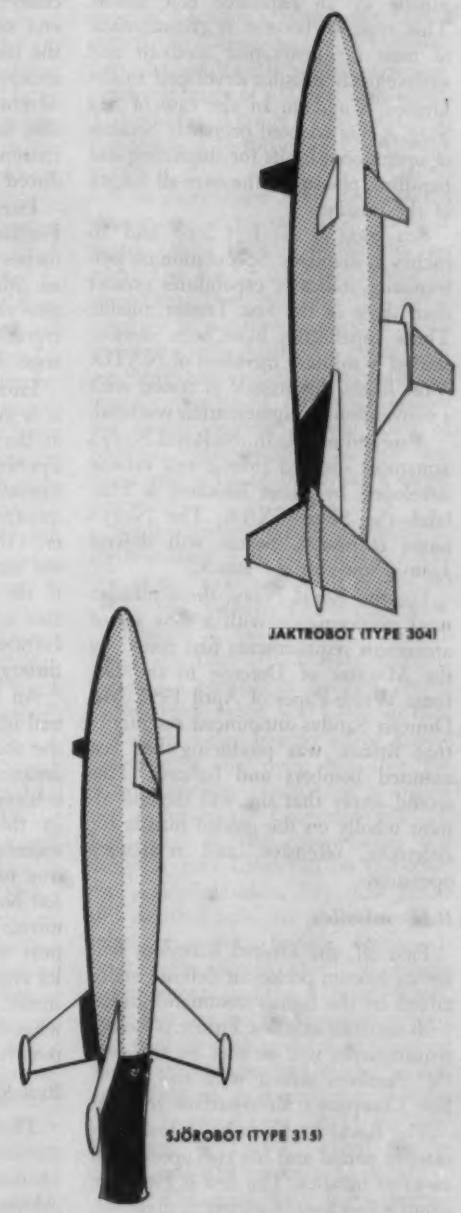


SWISS MISSILES

Free World Nations



COMMONWEALTH MISSILES



SWEDISH MISSILES

The British use "wrap around" booster units, instead of the tandem type employed by such U. S. Army missiles as Nike Ajax and Nike Hercules. This type of booster is composed of up to four small-diameter solid rockets wrapped around the missile body, and after boost they are ejected from the missile by an explosive bolt action. This type of booster is characteristic of most first-generation air-to-air and surface-to-air missiles developed in the United Kingdom. In the case of Sea Slug, it was adopted primarily because of operational limits for shipfitting and handling placed on the over-all length of the missile.

Sea Slug is 20 feet long and 16 inches in diameter. Speculation on performance indicates capabilities greater than those of the first Terrier missile. These capabilities have been demonstrated to military members of NATO. Most likely this missile is armed with a conventional fragmentation warhead.

A second missile in the Royal Navy's armament evolved from a test vehicle developed by Short Brothers & Harland—the Short SXA-6. The Navy's name is Seacat. Seacat will defend against low-altitude attack.

For the Royal Navy, these missiles mark conformance with a new set of armament requirements first stated by the Minister of Defense in the Defense White Paper of April 1957. Mr. Duncan Sandys announced essentially that Britain was producing her last manned bombers and fighters. This would imply that she will depend almost wholly on the guided missile for defensive, offensive, and retaliatory operations.

RAF missiles

First off, the United Kingdom will see an interim period air defense maintained by the fighter command armed with air-to-air missiles. Future offensive requirements will be met by the new "V" bombers armed with the A. V. Roe Company's air-to-surface missile.

The Royal Air Force has entered this interim period and has two operational air-to-air missiles. The first is Fireflash, about 8 feet long, 6 inches in diameter, with a fin span of 2.5 feet. This missile uses two wrap-around boosters for boost-only propulsion. The guidance system is an optical beam-rider type.

The pilot of the launching aircraft simply aims an optical gunsight device on target. This sight is aligned with a radar in the aircraft's nose which projects a guidance beam on the target. The missile is fired into this beam. It centers itself and rides up the beam until the target triggers its proximity fuze.

The use of this type of guidance, however, limits attack from the front or flank because of the resulting excessive maneuver demands toward the end of the trajectory. Consequently, the use of Fireflash is limited to tail attacks only. This fact, added to the advent of the Firestreak air-to-air missile, has relegated Fireflash to a pilot-training role only. It is not being produced for tactical use.

Firestreak is slightly larger than Fireflash, being 10 feet long and 9 inches in diameter. Firestreak includes an integral solid propellant boost engine rather than the dual wrap-around type. The major difference is in guidance. Firestreak uses infrared homing.

Firestreak production indicates that it is more versatile than Fireflash, but at the same time its infrared homing limitations must be recognized. These limitations include a heat source requirement and those imposed by weather. (Infrared guidance is blinded by the sun and can see no other target if the missile is fired within a certain angle of this intense heat source. Infrared guidance also is ineffective through thick clouds.)

An infrared system requires a thermal noise source that stands out above the thermal background. Although an amazing degree of progress has been achieved in the last few years working in this part of the electromagnetic spectrum, technology has yet a long way to go (witness the lack of infrared homing guidance for an antitank missile). Since the greatest source of heat emission is the tail cone of the jet engine on a modern bomber, Firestreak is best in tail attack and somewhat limited on frontal or flank approaches.

Red Shoes-Red Duster

The real answer to air defense in the United Kingdom is found in the Ministry of Supply's program for developing surface-to-air missiles. Two missiles have been developed: one is operational, the other is very close to that status. Work began on these missiles a number of years ago in what was called the "Red Shoes-Red Duster" program. To check the comparative advantages of rocket and ramjet propulsion, the British decided on this dual program to test both types of engines, with Red Shoes the rocket program, and Red Duster the ramjet development.

Red Duster, developed by Bristol and Ferranti, has become operational under the tactical code name Bloodhound. Bloodhound is primarily a missile that the Royal Air Force will use in the static air defenses of the home island. It is 25 feet long, 20 inches in diameter, and weighs 2,200 pounds unfueled. It uses the characteristic wrap-around boosters. Four of these are attached to the missile's body at the rear of two ramjet sustainer engines. Bloodhound's capabilities exceed those of Sea Slug and the missile may be classed with U. S. Navy's first Talos. The operational missile uses a semi-active homing system. Maximum missile velocity exceeds Mach 2.

On the other hand, the British Army was primarily interested in the Red Shoes (rocket) development. Red Shoes will become operational under the code name Thunderbird. Several hundred missiles have been fired in Australia and at Aberporth, Wales, in proving the capabilities of Thunderbird. Published dimensions of this missile show it is slightly smaller than Bloodhound. Thunderbird is 22 feet long, 20 inches in diameter, with a main fin span of 5 feet. Launch weight is 3,300 pounds.

Four wrap-around boosters attached to the rear part of the main body provide the first-stage propulsion. A solid rocket engine integral to the missile body provides the second stage. A liquid rocket was first tested for the missile, but a change has been made to a solid engine. This parallels the U. S. Nike Hercules change from a liquid system in the test missile to a solid propellant engine for the operational version.

Thunderbird is said to have a range of 35 miles and to reach supersonic velocities as high as 2,000 feet per second. It is fully mobile and transportable on an erector launcher which has built-in jacks for final leveling on broken ground. The English Electric Company is now developing the missile primarily for the British Army.

Antitank missiles

Britain's offensive missile capability begins with two private ventures into the antitank field. These infantry missiles have been independently developed by the Pye Company and by

Vickers-Armstrongs. No data have yet been published on the Pye missile.

The other weapon, the Vickers 891 or Vigilant, can be carried, set up, and fired from its carrying case by one man. A simple, visual line of sight command guidance system directs the missile to the target. The missile is steered by a thumb-operated stick. It uses a solid fuel engine and carries a flare to aid visual sighting. The Clevite Corporation of the United States had contracted with Vickers-Armstrongs for U. S. production rights. They have bought and tested this missile. They want to produce it for the U. S. Army as a replacement for Dart.

Still another antitank missile is being produced, or will be produced, for the British Army by the Fairey Aviation Company. Fairey advertises this weapon by quoting from a recent speech by the Secretary of State for War in the House of Commons: "We have under development an antitank guided weapon which will, if all goes well, remove the heavy tank from the battlefield."

Long-range systems

Moving to offensive missiles of longer range, major British effort is involved in two systems. The A. V. Roe Company is producing an air-to-surface missile for the Vulcan bomber called Blue Steel, whose size and configuration are very similar to those of the USAF Rascal. It is said to have a range of 120 nautical miles and a velocity of Mach 2. This will give the RAF a considerable stand-off bombardment capability. Blue Steel is underslung beneath the belly of the Vulcan and can be dropped from as high as 60,000 feet. It is likely that the Victors and Valiants of the Bomber Command also will carry this missile.

The second long-range system is the IRBM Blue Streak. This thermonuclear ballistic missile will have a range of more than 2,500 nautical miles, which is adequate in the way of deterrent capability. Being closer to the potential source of trouble than the United States, the British have no need for the longer-range ICBM.

Even though the USAF Thor will provide an interim capability, the British are developing Blue Streak with all possible dispatch. They feel that Thor is not a proved weapon. Additionally, they want the greater range and underground launch capability of Blue Streak.

The first Thor arrived in the United Kingdom last year and, in a joint announcement, the USAF and RAF stated that the first Thor squadron of the RAF was to have received all equipment by December 1959. Last year, RAF crews were trained at the Douglas Aircraft facility in Tucson, Arizona. These crews operate the entire Thor system without the nuclear warhead which, by current U. S. policy, must remain under U. S. control. For this reason, the British are developing their own nuclear warhead for Thor.

Blue Streak development hinges on a current series of firings of the Black Knight re-entry research vehicle. In September 1958 the Ministry of Supply announced that the first test had been successful. This 35-foot rocket reached an altitude of 300 miles before returning to earth, as planned, 50 miles from its launching site. Since then, there have been three more firings, all successful. The Black Knight is effectively the British Jupiter C. As the U. S. Army Jupiter C has served its purpose in re-entry heating research and satellite launching, so too may Black Knight if, when its re-entry tests are over, it is used to launch a satellite. For this purpose the British are considering a combination of Black Knight and Blue Streak, with perhaps some modifications of both.

If Black Knight and Blue Streak successfully orbit the first artificial moon bearing the Union Jack, the free world should hope that it happens before the Red Chinese can follow up with a fellow traveler for the Soviet Union's Sputniks. (There are indications that Red China has been agitating with the USSR for increased help to this end.) This is important if consideration is given the propaganda impact, especially among the neutral nations. Should the Chinese effort precede the British, it would be difficult for the West to explain away a country only ten years under Communist control with a space technology more developed than that of the "advanced" European Powers.

Australia and Canada

In fields other than satellites, Britain's efforts in missile development are tied to Australian and Canadian armaments by the links of the Commonwealth.

Australia, with only a limited development program of her own, provides for the Commonwealth the longest overland test range in the free world. This is the Woomera Range, a thousand miles long, in the Western Australian desert. Currently, Britain and Australia are extending this range out over the Indian Ocean to the northwest to Christmas Island. Telemetry stations on Christmas Island will give the Commonwealth a total overland-overwater range of 3,000 nautical miles. This additional range is consistent with the needs of forthcoming Blue Streak tests.

The Australians have developed a short-range radio-controlled antitank missile called Malkara which fills two roles. The RAAF uses this missile in an air-to-surface role and the Army employs it surface-to-surface. For an antitank missile Malkara is quite large, weighing almost 200 pounds. Britain recently purchased 160 Malkaras for test firings on the Solway coast of Scotland. Also included in this purchase was a lot of 60 Jindivik target drones.

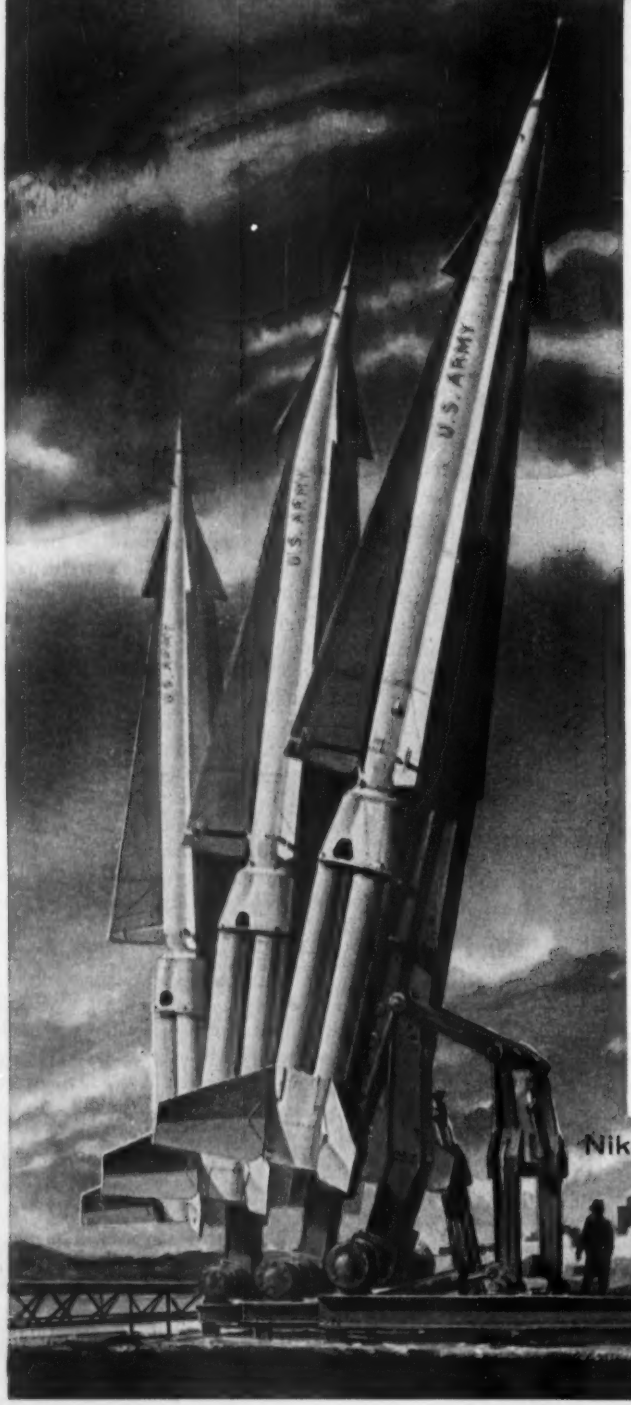
While Jindivik is not a missile in the true sense of the term, it is probably one of the most successful drones yet produced anywhere. The current model, Jindivik II, has an altitude capability greater than 70,000 feet. Australia has sold a number of Jindivik drones to Sweden, France, and Great Britain.

Canada today has no active missile program of her own, but like the Australians she contributes a missile test station to the Commonwealth effort. This is the cold-weather test range at Fort Churchill on the western side of Hudson Bay, just below the Arctic Circle. In addition to her relationship with Britain, Canada is even more closely allied to missile developments in the United States. Fort Bliss has trained Canadian officers and men in such systems as Corporal and Ajax, and the Air Defense School, by agreement, is using some of these people as instructors. The U. S. Army has used the Fort Churchill test facilities and will continue to do so.

The Canadians have been producing the U. S. Navy's Sparrow II missile in Canada, and the CF-100 has been adapted for its use. The successor to the CF-100 until September of last year was to have been the CF-105 Arrow interceptor. The Canadians, however, have announced that they

(Continued on page 42)

O'er the ramparts...



U. S. Army's

NIKE HERCULES...

Solid rocket motor built by Thiokol for Nike Zeus has produced greatest mass discharge rate and thrust of any single

Through the combined efforts of the U.S. Army, Western Electric, Douglas Aircraft, THIOKOL Chemical and other key members of the missile industry, America is moving toward the realization of a critically needed anti-missile missile.

The Nike-Zeus system — big brother to the Army's Nike Hercules which now stands guard over major population centers — is being designed to detect, charge and destroy attacking ICBMs many miles from their targets.

Assigned development of the boost for the Zeus, THIOKOL has already designed, built and successfully test-fired a motor achieving over

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solid propellant motor ever test-fired in the free world . . . unleashes more than 400,000 lbs. of thrust in static firing!

400,000 pounds of thrust—power enough to deliver the instant reach of high altitudes needed for effective defense.

While the Zeus booster stands as the most powerful solid propellant motor now on record, it in no way represents the ultimate capability of present THIOKOL facilities. Current capacity includes motors still larger—of ICBM and even satellite size.

Under Army direction, and in cooperation with Douglas Aircraft, THIOKOL development in the Nike program has advanced the science of rocket propulsion.

DOUGLAS

The Nation's Partner in Defense

will replace the interceptor as their major air-defense weapon system with the USAF Bomarc guided missile. The Canadians hope to produce the Bomarc SAGE system and to install it in Canada as a part of NORAD (North American Air Defense Command) whose headquarters is at Colorado Springs, Colorado.

French missiles

Outside the Commonwealth, but still within the NATO alliance, France has the next most extensive guided missile program. France probably has done more experimental missile work than Britain, but she has had to make an assessment of her most critical military needs and align her development efforts with this assessment. This is made necessary by France's relatively limited resources and even more limited budget.

What work France has done has been first-rate. The Matra Company has developed a number of air-to-air missiles. One of these, R-05, is about 10 feet long, 13 inches in diameter, and has a five-mile range. It is similar to the British Fireflash in that it uses an optical beam-rider guidance system.

In the surface-to-air field, France has developed for her navy the subsonic Maruca training missile, which is in use, and the Masurca. Masurca is just beginning its sea trials. It is a supersonic ship-to-air missile with capabilities comparable to Terrier, and uses semiactive homing guidance. The Masalca is yet another missile. It too uses semiactive homing guidance and has a longer range than Masurca.

French surface-to-surface missiles include the SE 4200 series, produced for the army by Sud Aviation. This series has the monoplane configuration traceable to the V-1. The tactical model should have a 60-mile range. Another surface-to-surface missile, Malaface, which will have a 20-mile range, is being developed for the navy to give it an increased shore bombardment capability.

SS-10 and SS-11

The most significant French missile developments to date have been the antitank SS-10 and SS-11. These missiles are wire command guided, solid rocket propelled, and have shaped warheads that can pierce very heavy modern armor.

The SS-10 is 3 feet long, 6 inches in diameter, and weighs 34 pounds. It utilizes only one set of four rear fins which have a span of 29 inches. The SS-11 has a similar outward configuration, is a little longer, and about twice as heavy. The greater capabilities of the SS-11 are commensurate with its increased size. Whereas the SS-10 is usable to ranges of one mile, the SS-11 can kill tanks at maximum ranges of two and one half miles. The velocity of the SS-11, Mach O.6, is about twice that of its smaller brother. The SS-11 will supplement the SS-10, not replace it, because the SS-10 has a better usable minimum range. In an AT missile, effectiveness at a very short minimum range is as important as effectiveness at maximum range.

The SS-10 may be fired from its packing container mounted on a vehicle or a tank, or from the ground. The guidance operator directs it to target visually (he simply eyeballs it in) using a lever mounted on a small control box. If observation is difficult he may use binoculars as an aid. The missile also is fired from helicopters at air speeds up to 60 mph.

In addition to all these capabilities the SS-11 may be fired as an air-to-surface missile from high-performance aircraft. The French Air Force has adopted the missile for this purpose.

The characteristics of these missiles have proved so favorable that a number of nations have bought the SS-10 and are expected to make similar purchases of the SS-11. West Germany recently bought a thousand rounds. An unsubstantiated report stated that Israel bought the missile and used it against Egyptian armor at Suez. Sweden has purchased this missile. A number of years ago the United States bought an early version of the SS-10 and tested it at several military installations in this country. Last year a second lot of missiles was bought. Tests were conducted both by Seventh Army in Europe and USCONARC in the United States. The results were good. As a result, we are buying the SS-10 under the Military Assistance Program for NATO shield forces and outright for our own forces, as a replacement for the obsolete Dart.

Similar tests are being conducted for the SS-11. If we purchase this weapon, it will be the first return in terms of hardware on American money put into the NATO Mutual Weapons Development Program, a part of the Military Assistance Program, from which the SS-11 received a considerable amount of development funding.

The Foreign Ministers of France, West Germany, and Italy have concluded a pact for combined weapons development which includes improved missiles. Although this agreement is independent of the NATO Mutual Weapons Development Program, it will further reinforce it.

In the future, it is expected that this pact will be expanded to include the Benelux countries. This is a major step forward for NATO, advantageous because the way is open for an increased transmittal of new techniques among these countries and an elimination of duplicated efforts.

This agreement marks German reemergence in missile R&D. Although not prohibited from employing guided missiles at the end of World War II, Germany was forbidden to develop missiles beyond certain sizes and range limits. A joint French-German institute for explosives and ballistics development has been located at St. Louis in Alsace.

The Benelux nations

Though not yet working with Italy, France, and Germany, Belgium and the Netherlands are beginning to show considerable interest in missile production. The Belgian press has announced that a number of national firms have formed a cartel for missile development and production. The first effort of this combine is a surface-to-air missile called Vogelspik. It is doubtful that Vogelspik is much beyond draft design, but during early October 1958 there were reports that Belgium had fired her first guided missile. Other reports on the activities of this group indicate a management desire to buy the production rights and produce proved missiles from other Western countries rather than start on original designs from scratch.

That last statement also applies to the Dutch Fokker Aircraft Company. Fokker's general manager stated that his company plans to enter missile production sometime between 1960 and 1966. His company hopes to buy production rights for various American missiles.

Although today these last-mentioned NATO countries depend primarily on the United States, Britain, and France for missile armaments, they could step outside the NATO alliance and buy

Silence deep as death

● "There was silence deep as death, and the boldest held his breath, for a time." Thomas Campbell was describing the Battle of the Baltic, in 1801. But many a submariner will recognize the moment in modern underwater combat, when complete silence is the only way to survival.

Modern submarines make the problem of silence tougher, for in these modern boats, some machinery must always be running. This is why *tech/ops* is probing, for the Navy's Bureau of Ships, the transmission of noise through water pipe lines through structure and into the sea . . . to be picked up by enemy ears. And *tech/ops* has found *new* ways of testing for such noise . . . methods that light the way toward "silence deep as death" for our Navy's pigboats.

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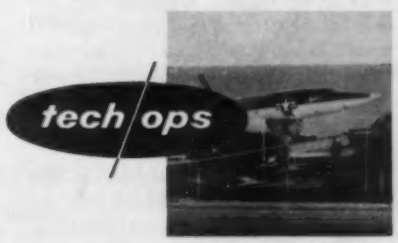

missiles from such neutral countries as Switzerland or Sweden.

Swiss contributions

The Oerlikon-Contraves Company of Zurich is wholly responsible for the Swiss contribution to missile art. This company is one of the best armaments manufacturers in postwar Europe. Its main contribution is a series of surface-to-air missiles called Oerlikon, first announced in 1950 and put on the world market. This series has undergone constant redevelopment. The first version, Type 54, became operational in 1954. This was followed in successive years by Type 55 and Type 56.

Present models are called Type C and Type D. Type C is the training missile, Type D is the tactical weapon. Both have the same dimensions (length 19.5 feet, diameter 16 inches) and the same configuration with two sets of triangular fins. The difference is found in rocket engine power. The training round is propelled for 30 seconds with 2,200 pounds of thrust to Mach 1.8. It has a controllable range of 13 miles and altitude capability of 26,000 feet. The tactical missile is under the same thrust for 45 seconds and reaches 20 miles at 65,000 feet. (This is quite good considering that the missile does not employ a booster and weighs only 840 pounds, of which 88 pounds are required for the warhead and fuzing.)

The most unique feature of Oerlikon 56 is its type of airframe. The Swiss employ a wire-wrap technique. A relatively heavy-gauge aluminum wire wrapped on a mandrel forms the airframe, which is then sealed with one of the new epoxy resins, a hydrocarbon plastic with good adhesive properties.

Type D employs beam-rider guidance and a liquid rocket engine. In Oerlikon development, the Swiss investigated all types of guidance applicable to the surface-to-air missile. They have tested both liquid and solid engines. In fact, it is believed that the next missile in this series, Oerlikon 58, will use semiactive homing guidance and a solid rocket engine. Although the Zurich firm has developed Oerlikon, this missile is being produced by the Italian subsidiary, Contraves Italiana, because Swiss governmental policy of traditional neutrality doesn't encourage arms export.

Another Oerlikon product is the Cobra antitank missile which was developed by a German team. Oerlikon is producing this missile as the Moskito. Moskito is notable as one of the free world's smallest missiles. It is controllable from 50 yards out to about 1,600 yards. It carries a 5.5-pound shaped-charge warhead. Because of its small size and limited capabilities, the Swiss have been unable to sell it in quantity abroad. However, there are rumors that the U. S. may test it.

Sweden's "robots"

Sweden, the only other neutral producing missiles, has the facilities for contributing significantly to missile technology. The Swedes are interested in air-defense missiles, short-range coastal defense missiles, and tactical missiles. This is consistent with Sweden's long-standing policy of strict neutrality. Secondly, Sweden is developing only those missiles which cannot be bought more cheaply abroad.

The Swedish Guided Weapons Bureau is the directing agency behind the development of these "robots," the Swedish term for guided missiles: Robot 304 (Jaktrobot), an air-to-surface missile which will be used primarily against sea targets (its principal carrier will be the SAAB-32 Lansen all-weather attack aircraft); Robot 315 (Sjörobot), a surface-to-surface missile (two destroyers, *Halland* and *Smaland*, for some time have been equipped to carry this missile); Robot 321A, a test vehicle in the air-to-air missile development program; and Luftförsvarsrobot, an unmanned interceptor of the USAF Bomarc class. Luftförsvarsrobot can intercept up to 150 miles at high altitudes. But as Bomarc is late in development, so is this Swedish missile, and Sweden cannot afford to wait.

Therefore, Sweden has placed an order with the British Bristol and Ferranti firms for the Bloodhound, primarily to be used for training. Sweden also has purchased the SS-10 antitank missile from France (already operational in the Swedish Army) and the SS-11. Other Swedish purchases include the Australian Jindivik and the U. S. Navy Sidewinder. Since a small nation like Sweden cannot develop and produce all the guided missiles needed in modern warfare, that country constantly looks abroad for missiles and missile systems that will fit its special needs.

Japan's entry

On the other side of the free world, Japan is getting into the missile business. Japan's entrance may well be marked by a pact concluded between Oerlikon-Contraves and the Mitsubishi Industries. Mitsubishi has bought production rights to Oerlikon in the Far East. Other Japanese companies are doing work in solid propellants and small research rockets. The Japanese Defense Agency allotted 600 million yen ($1.7 million) in 1957 for rocket research, dedicated to the eventual development of an inexpensive surface-to-air missile for home defense. Current target date for this system is 1961. In line with this, the Japanese arms industry shortly is expected to dispatch an inspection team to the U. S. to lay the groundwork for missile production. This team would visit American production facilities.

How the U. S. fits into the picture

The U. S. fits into this overseas picture in terms of money and hardware. Not to be discounted is some $63 billion in foreign aid since World War II, which indirectly and directly has contributed to present missile posture abroad. As well, in terms of American hardware, Denmark, Norway, Italy, and Turkey are scheduled to receive the Ajax and the free-rocket Honest John. Italy will be the first foreign country with Nike defense. This year battalions will go into operation around Rome, Naples, and Milan. The Italians will have the first U. S. Army-developed Jupiter IRBM.

West Germany plans to buy two Matador squadrons and may take over some Nikes and Honest Johns. Italy and West Germany are not resisting nuclear-armed missiles, but Norway and Denmark are steering clear of such weapons. Although these nations are not neutral, they do not want to incur Soviet anger.

For the most part, the U. S. aid program is restricted to a one-way channel, but the U. S. armed forces have begun to avail themselves of European research facilities. The Air Force is working from Brussels, Belgium; the Army from Frankfurt, Germany; and the Navy is farming out limited basic research contracts from London.

In the future, this could grow into some type of combined program among all the allies. Perhaps the Franco-German-Italian pact, already concluded, will expand into such a combined program. Such an arrangement must overcome national pride and other persistent stoppers, but eventually might strengthen the military posture of the free world far beyond what any new Soviet seven-year program could hope to overcome.

'Jeep' XM443E1 showing versatility of its platform principle.

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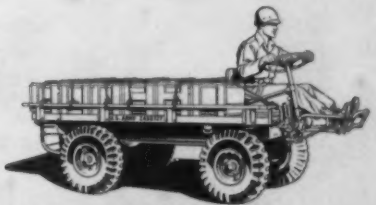

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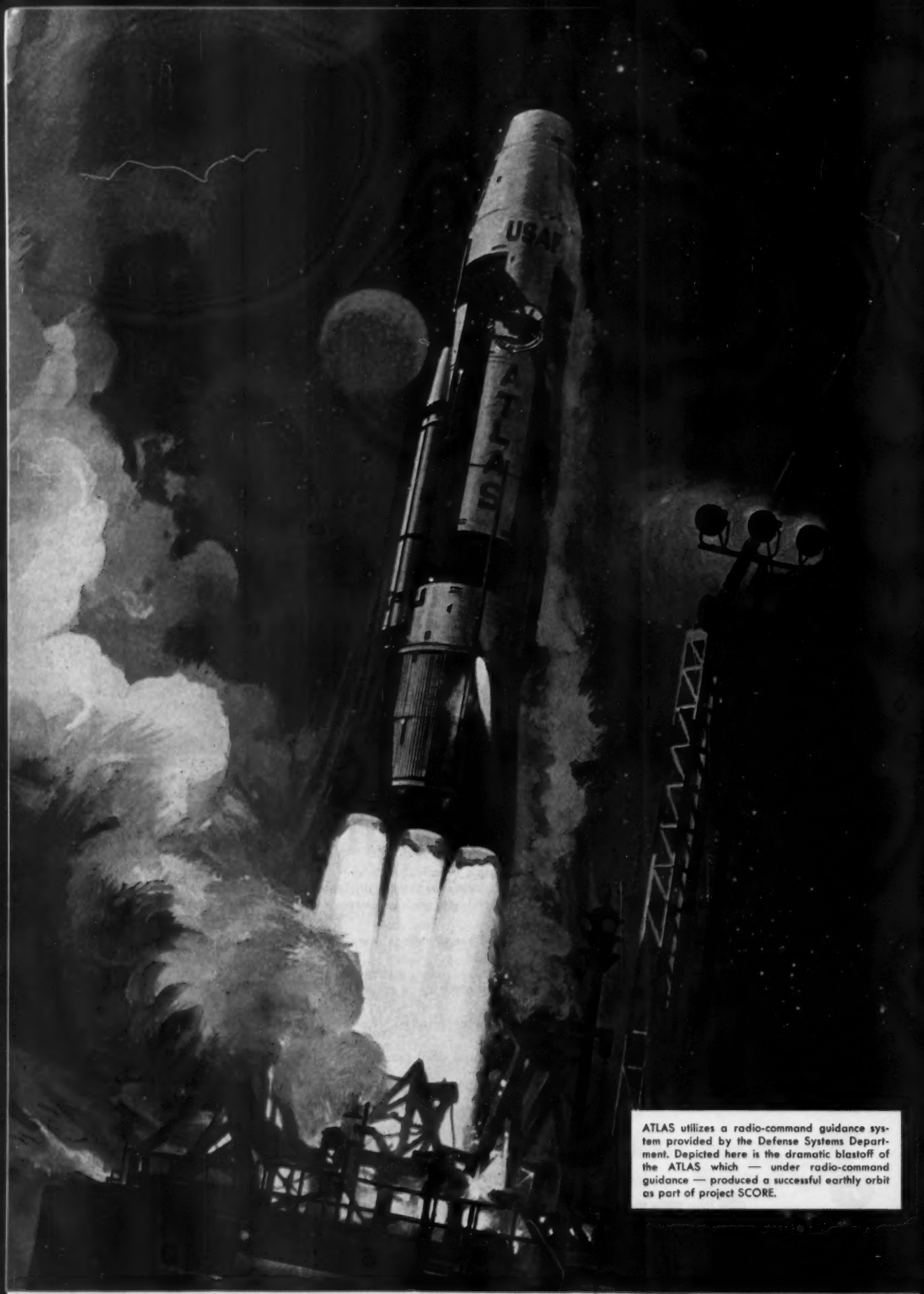

ATLAS utilizes a radio-command guidance system provided by the Defense Systems Department. Depicted here is the dramatic blastoff of the ATLAS which — under radio-command guidance — produced a successful earthly orbit as part of project SCORE.

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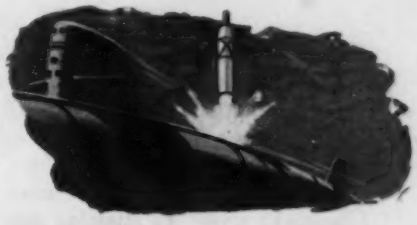
. . . whose inertial guidance and fire control equipments will be provided by the Ordnance Department, Pittsfield, Mass. — center of the Division's capabilities in precision electro-mechanical elements of sea and land-based weapons systems. In addition to POLARIS equipments, the Department produces radar antennas, directors, launching and handling equipment and underwater ordnance.



LIGHT MILITARY ELECTRONICS DEPARTMENT

SIDEWINDER
. . . the deadly air to air missile whose infrared guidance and control units are provided by the Light Military Electronics Department, Utica, N. Y., is representative of its capabilities for military electronic subsystems and equipments contained in, or launched from, air vehicles. Its additional contributions range from electronics countermeasures to integrated avionic systems.

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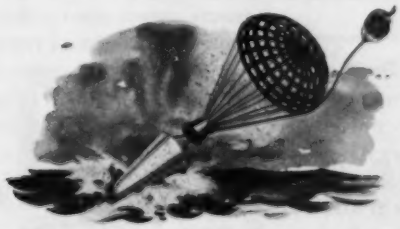
. . . for air space management is being developed and produced by the Heavy Military Electronics Department, Syracuse, N. Y. — center of the Division's capabilities for the design, production and installation of land-based and sea-borne detection, guidance and control equipment. Major contributions of this Department range from long-range sonar to the largest known radar systems.

MISSILE AND SPACE VEHICLE DEPARTMENT



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. . . such as the ATLAS experimental nosecone — largest re-entry vehicle ever recovered from space — are designed and built by the Missile and Space Vehicle Department, Philadelphia, Penna. Experienced in space technology, MSVD developed operational ATLAS and THOR re-entry vehicles. Other responsibilities range from certain missile arming and fuzing projects to the re-entry/recovery vehicle of the DISCOVERER satellite. 224-3

DEFENSE ELECTRONICS DIVISION

GENERAL ELECTRIC

SYRACUSE, NEW YORK

G5 THE MISSION OF THE CIVIL AFFAIRS DIVISION

Brigadier General STROM THURMOND

IT is true today even to a greater extent than it was in Clausewitz's time that "War is an act of force and to the application of that force there is no limit." However, since the real objective of any war is to impose our will upon the enemy, is it not sensible to exploit all means, in addition to the force of arms of which Clausewitz spoke, in attaining that objective? Armed conflict—or force—usually will be required in the end to crush the enemy's resistance; however, the proper handling of military-civilian relations can also be a potent weapon in itself. This fact is not generally recognized by the United States and that "weapon" has not been used to the fullest extent by this country in the past.

In Clausewitz's day, commanders in the field had little concern with civilians on the battlefield. Certainly the examples of Hiroshima and Nagasaki testify that this is no longer the case. Yet, of all the phenomena of warfare, that facet which is least understood is the factor of civilian populations and the tremendous problems their presence imposes on the commander in areas of military operations.

Why is this so? How do civilians affect the commander's actions in his day-to-day operations? What is the commander's responsibility? What has been done, and is being done, at all levels to assist him?

As the scope of warfare broadens with the employment of weapons of increasing destructiveness, the magnitude of the commander's civil affairs operational responsibilities becomes correspondingly intensified. Modern warfare, even if destruction is measured and is limited to the actual requirements of the hour, will create tremendous problems. Let us examine some of the problems which will inescapably confront a commander.

Civilians, in numbers greater than ever before, will suffer personal loss, injury, deprivation and lack of the barest essentials of life. They will not have the accustomed guidance of their former agencies of local government. Continuing damages may contribute to mass hysteria, and tend to convert a previously normal populace into an uncontrollable mob—a multitude of hungry, frightened, injured, diseased and disrupted people who seek only to flee further injury with whatever personal possessions they can carry, and obtain, by any means possible, what is necessary to survive.

How can the problems posed by these civilians adversely affect a commander's combat operations? Noncombatants can clutter the roads, and interfere with or prevent the essential movement of troops and supplies. They can compel a diversion of combat troops to protect lines of communications and supply installations. They can require a similar diversion of troops to neutralize guerrilla actions fomented by undetected enemy agents among them. Enemy civilians can spread contagious diseases among our troops. They can furnish intelligence to the enemy. More, they can seriously disrupt what might otherwise have been a successful operation. Proper measures must be taken to estimate troop and supply requirements, and plans and preparations must be made in advance for necessary civil affairs measures.

Thus we can readily see that a commander's civil affairs operations are dictated fully as much by military necessity, as by the customs of war and the principles of humanity which have always guided our armed forces.

Now, what must the commander do, and what must

Brigadier General Strom Thurmond, USAR, is the junior U. S. Senator from South Carolina, Past National President of the Reserve Officers Association and of the Military Government Association, and a member of AUSA's Advisory Board of Directors. During World War II he served in both the Pacific and European theaters, participating in the Normandy campaign with the 82d Airborne Division. His mobilization assignment is Deputy Chief, Office of Civil Affairs.

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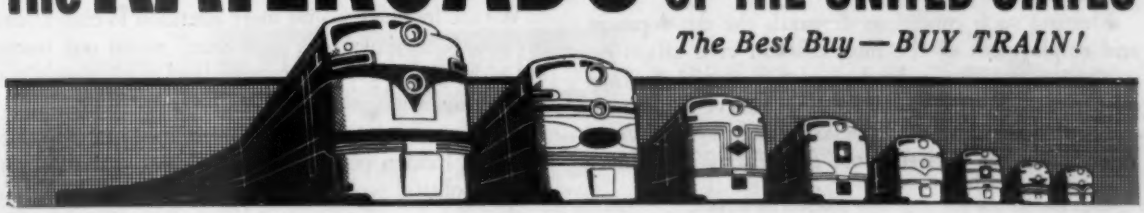

he know, to insure that civilian problems will not prevent, or seriously hamper, his military operations? There is no magic formula, but the task is not an impossible one. As is true of everything that occurs or may occur in his unit, the commander must remember that he alone is responsible for civil affairs operations. This responsibility can not be delegated, nor can it be shirked. The attention his staff displays in this phase of his duties will be a reflection of his own interest. Therefore, he must strive to gain an understanding of civil affairs objectives and techniques, both from a staff and a unit standpoint, in order to enable him to employ his civil affairs units with the same skill as he does his combat arms.

Estimate of civilian situation

The commander's decisions as to his future courses of action have long been based on estimates of his own and the enemy's capabilities, the weather, the terrain, and so on. Little consideration has been given to the effect of civilians in his area, or how their support, or lack of it, will influence his operations. Thus his estimates, in many instances, have not been complete. The commander must carefully weigh civil affairs factors such as the number of persons in the area, the status of the local government, health problems, economic conditions, food supplies, medical stockpiles, number and condition of hospitals and other public institutions, religion and social customs of the people. The estimate which considers these factors should be weighed as carefully as estimates by his staff. If the commander doesn't do this, he is not taking maximum advantage of all the tools available to him.

Not only must the commander's estimate of the situation reflect civil affairs thinking, the orders he issues must put this thinking into action. Staffs must check as diligently to insure that this phase of the operation is performed as skillfully and with the same care as any other.

The Assistant Chief of Staff, G5, is responsible for all matters pertaining to the local population, government, economy, and such institutions as schools and hospitals in areas occupied by United States armed forces. He must insure that civil affairs planning is constant, continuous, and fully coordinated with all other planning in order that civil affairs operations may best contribute to the commander's over-all mission.

As we look ahead to a possible nuclear warfare age, we see in the combat commander's mission intensified civil affairs operations derived from the vast numbers of human beings who will be affected by the extent and destruction of such a war.

Meeting such conditions demands the development and employment of the most efficient civil affairs organizations which can be devised. Current civil affairs doctrine is adaptable to the requirements of the atomic-age battlefield. It is not old; it has emerged since World War II, and is derived from the lessons of military history.

As a result, all the civil affairs units are tailor-made to meet the requirements: first, of the area of the world in which they may be deployed; second, to support any size of tactical unit; and third, of any type of transportation, to include airborne operations. These units range from the area headquarters A and B units, which normally support a theater headquarters, to the civil affairs groups at field armies, civil affairs companies at corps, down to the small civil affairs platoons which support the Army divisions.

We have dwelt extensively on the functions of the commander in the civil affairs field. What is being done for him that he is unable to do for himself?

The civil affairs structure

The Office of the Chief of Civil Affairs has been established in recent years on a General Staff level at Department of the Army under the direct supervision of the Deputy Chief of Staff for Military Operations and the Chief of Staff of the Army. The Chief of CA advises Department of the Army agencies on, and exercises staff supervision over, all matters pertaining to relationships, derived from implied or explicit intergovernmental agreements, between the U. S. armed forces and the government and people of countries in which our forces are or may be employed. He advises Department of the Army agencies on the assumption of authority in areas occupied by U. S. armed forces; and also on the planning, training and readiness measures of our STRAC and USAR units requisite to the Army's conduct of civil affairs operations.

Presently, for the first time between wars, civil affairs units and personnel are being trained. A civil affairs group and two civil affairs companies (all an integral part of the STRAC family) are being trained at Fort Gordon, Georgia; a U. S. Army Civil Affairs School also is operating at Fort Gordon for training G5 staff officers and personnel of civil affairs units; extension courses and material for USAR Civil Affairs schools are provided for those reserve officers unable to attend courses at the Civil Affairs School; a Civil Affairs branch has been established and is flourishing in the Army Reserve; civil affairs staff sections and units are participating in ZI army maneuvers and exercises on a greater scale than ever before; CA-USAR units have been activated to meet foreseeable contingencies; TOE have been provided for G5 staff sections on an augmentation basis for headquarters of field armies and below; and, more important, civil affairs doctrine and functions are being taught officers attending the various Army service schools.

We are inclined to give more attention to civil affairs operations in times of a "hot war," when our troops are actively engaged in a foreign land. This should not necessarily be so.

The increased importance of military participation in U. S. foreign policy clearly indicates that the solution of political problems cannot be governed by purely

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political considerations. The varied methods of Communist aggression being employed in the current so-called "cold war," require that the defensive posture of any country be ready to meet any method by which this aggression may occur. In many countries, greater danger now exists from internal subversion of civilian populations than from external aggression.

Future capabilities

The various foreign military forces, particularly those with whom we have Military Assistance Advisory Groups, have a unique capability of combating this Communist subversion. Therefore, it is becoming vitally important for personnel of Military Assistance Advisory Groups to become aware of the need to advise local military forces as to specific means of combating this Communist approach from within.

A primary objective of our Military Assistance Program is to save the countries concerned from falling under Communist domination. This includes not only building up their military forces, but also strengthening those nations' political, economic, and social structures. Most of the major activities of this nature are in the civil affairs field and will require as advisors officers trained in civil affairs. This capability is just beginning to be utilized. There is unlimited room for expansion.

In conclusion, we must not overlook or disregard the future domestic capabilities of civil affairs. We must not overlook the possibility that an enemy might attack the United States. In view of this, we must not fail to consider the fact that civil affairs combat support may be required in an area where the local population is not foreign but American.

In time of disaster, the military services have always been called upon to provide a reservoir of strength, aid and comfort for American communities. If this has been true in lesser calamities, then certainly the armed forces will be called upon to assist in civil defense measures in the event of a nuclear, chemical or biological attack.

Against this contingency, it is vitally important to our nation's defense to have a civil affairs capability, alive and working; to have trained, and immediately available, civil affairs personnel capable of providing the skills and leadership that such times of crisis demand.

In present-day warfare, the civil population, and the extent of the damage in areas where the military commander will be operating, will require primary consideration. Regardless of whether he is operating on our own soil or in a foreign area, the first consideration will be survival. This will be true whether it is a city, our national survival, or the survival even of mankind. Upon the shoulders of the military commander, upon his realization of the complexities involved, and upon his handling of this problem of survival, may well rest our future as a nation and the future of mankind. We can only hope that our nation, in a period of relative quiet, is doing what it can to facilitate the accomplishment of this awesome mission.

CONCEPTMANSHIP

(Continued from page 29)

advent of the atomic bomb? What gimmick, lying deep in the dark recesses of their concept mill, enabled them to produce such startlingly pertinent ideas as the indirect approach, the compressed command chain, the pentagonal structure, the corps-less army, and so on?

Fuller looked at the tank and listed its attributes. It had armor. It had firepower. It had range. It was a personnel carrier. What else had these same attributes? The warship, of course! What could the art of naval warfare teach the ground commander about the employment of tanks? The airplane also possesses the same basic attributes as the tank. Were naval tactics useful for this weapon too? By the substitution of new weapons in the tactical context of the old, Fuller uncorked a new device for unshackling his mind from convention.

Now listen to Liddell Hart as he alludes to The Technique: "Since Guderian described himself as my 'disciple' in the field of tank warfare it may be of some historical interest to mention that the *concept* of this deep strategic penetration by armored forces developed in my mind initially from study of the long-sustained drives carried out by Genghis Khan's all-mobile forces in the Mongol campaigns of the 13th century, while its application against modern mass armies dependent upon railways for supply was made clear in an analysis of Sherman's 'marches' and Forrest's dislocating 'raids' in the 1864-5 campaigns of the American Civil War. The conclusions were strengthened in a study of the effects that could have been produced by such forces in 1914 if they had then existed. As for the *method*, this was simply a strategic adaptation for armored forces of the tactical 'expanding torrent' attack which I had worked out earlier, at the end of the 1914-18 war."

Elsewhere Liddell Hart has written that he has "become convinced in my own experience of the value of the historical approach to current problems. In trying to solve such problems, or make forecasts, it has repeatedly proved helpful to get a projection from the past through the present to the future."

As a practical exercise, find a discussion of World War I tactics. Every time you come across the terms "artillery" and "aircraft" substitute the word "missile." Range over the written accounts of other periods and do the same thing. Bring into play the weapons and equipment still being developed or still in the dream stage—ducted-fan aerial platforms, earth-curving radar, atomic-powered helicopters and convertiplane troop carriers, cheap signal-homing missiles—and Thucydides will take on an entirely new significance for you.

That is the stuff of which concepts are made.

THE MONTH'S CEREBRATIONS

GOOD-BYE, SOLDIER

You can learn something of value by interviewing the departing serviceman

LT. COL. DANIEL T. CHAPMAN

Five soldiers sat shivering in the chill fog of San Francisco Bay. They wore the faintly dejected look of soldiers anywhere who are awaiting a truck ride to an unknown destination. I was the commander of an air-defense battalion, and the five were sitting in my motor pool. When I asked the motors sergeant about them, he told me they were to be taken to the separation center across the bay to be processed for return to the East, where they would be discharged.

These dejected soldiers disturbed me. Here were men who had served honorably and to the best of their ability during the two years they had given to the service of their country. Now they were leaving the service without one word of thanks or farewell. I also reflected that I had heard a great deal about welcoming a soldier to his new unit but nothing of how to bid him good-bye.

From that day I have followed an unvarying practice of personally meeting with soldiers departing from the battalion I now command. This visit is held in my office. The main purpose is to thank the soldier for his service and to wish him Godspeed in his future career, be it civilian or military. I do not see those leaving under conditions other than honorable.

During the course of many such visits, however, a secondary purpose has evolved, one which has been of considerable assistance to me as a commander. After explaining its purpose and expressing my gratitude, I talk informally. Such a conversation is easy, in the circumstances. From the soldier's point of view, he has passed the test of service and is either returning to civilian life or proceeding to a new station. He has no axe to grind and can express himself as objectively as his insight allows. Casual remarks regarding home states, families, and plans for civilian jobs, and the like, place the conversation on an informal plane and prepare the way for an interchange of information which can be valuable to any commander.

I have formulated some favorite questions that elicit such information. In many instances the answers have been valuable to me. In addition, they afford an interesting view of the "new" Army as the soldier sees it. Here are some questions and answers.

Was the Army better than or worse than you expected it to be?

I ask this of all being discharged from a first enlistment, and always it results in an immediate double-take. Each man has to think back and recall exactly what he *had* expected. A surprising number, after some reflection, say the Army was easier than they expected. A little more probing develops that "easier" means discipline was not so rigid as expected. Personally, I have yet to determine whether or not the response is favorable to the Army. In any case, this is the most frequent answer. Occasionally I draw a bitter diatribe. Quite often in such cases the mark of a recently removed chevron is evident.

What was the most pleasant feature of your service?

This draws a variety of answers, with no majority opinion. However, in each case the soldier could think of some pleasant aspect even though some seemed to require considerable reflection. A significant number cite the opportunity to develop a mature outlook and a capacity for responsibility. This answer is most prevalent among those leaving the service to resume their education. Other answers concern opportunities for travel, the camaraderie of Army life, and the attainment of technical skills through service schooling. Regretfully, I must say that many of those who are happiest over the attainment of new technical skills are bound for industry.

What was the most unpleasant feature of your service?

Eyes light up at this one, and hitherto laconic soldiers become highly articulate. Occasionally a tactful reminder is required; unpleasant features rather than persons are meant. Those who feel they missed promotion unfairly are particularly vehement and emotional. Soldiers in this group are gifted with photographic recollection of dates, times, and persons concerned. I always remind the disgruntled that personally I can do nothing, though perhaps I can modify the promotion system to reduce inequities in the future. In fact, based upon information obtained in this fashion, I have been able to improve selection processes to a considerable extent. Also, I have concluded that if you want to send soldiers back into civilian life enraged, the best way to do it is by mishandling promotions.

A secondary theme of discontent lies in a vague concept known as "regimentation." Regimentation does not seem to involve discipline since many of those who cite it as the most unpleasant feature have also said the Army was "easier" than they thought it would be. Rather, it seems to be concerned with what the soldier considers an unwarranted interference with his personal liberties. Investigation of certain of these conditions

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revealed some restrictive requirements which could be relaxed without detriment to military efficiency or propriety. For example, unnecessarily frequent changes of uniform in many instances can be avoided by careful planning.

The third most popular cause for discontent concerns lack of free time. Since operational requirements often necessitate extended periods of duty, little can be done to ease this annoyance other than to make absolutely certain that off-duty time is given impartially.

If you had the authority, what one thing would you change to improve the condition of others like yourself?

For the unit commander this is the jackpot question. No soldier ever finished a tour of service who has not daydreamed about such a chance, and there are few who have not discussed it interminably with their comrades. Some of the resultant ideas are poorly thought out and clearly unfeasible. Some are interesting, and not a few are directly applicable and suitable for immediate implementation. The nature of the response can be directly equated to the soldier's intellectual and emotional capacity. In general, those less gifted mentally propose broad, sweeping reforms which would revolutionize the military structure. Obviously, wearing of the uniform cannot be abolished, nor can the military justice system be eliminated. Both "reforms" have been suggested by eager but naïve soldiers in their valedictories. Those with more capacity for constructive thought usually propose more specific corrective actions, which in some instances can lead to immediate improvement. Improvements in enlisted promotion procedures, more equitable pass policies, and improved facilities for noncommissioned officers have resulted. This method of gathering ideas has an advantage over the suggestion box type of solicitation; suggestions can be given orally directly to the commander in an atmosphere which encourages objectivity.

It is apparent that a danger exists: these interviews could degenerate into uncontrolled B-bag sessions, or attempts could be made to obtain personal revenge against unpopular people in positions of authority. In addition, in the case of skilled soldiers departing for discharge, there is a temptation to turn the occasion into a reenlistment sales talk. This is neither the time nor the place. Primarily, this visit is intended to express appreciation to a departing comrade. If that is borne firmly in mind, the meeting can benefit both persons and their unit. At least the soldier leaves with the thanks of his commander and in the knowledge that he had an opportunity to express himself on matters to which he had given considerable thought. At best, real improvements can be realized in the operation and administration of the unit.

World War II and Korea turned out more than 8 million Army alumni. Of these, a substantial number went home bearing resentment toward the Army, as evidenced by public criticism during the postwar periods. Certainly a few words of thanks from the unit commander will not send all of them home happy, but it could well be a step in the right direction.

Lieutenant Colonel Daniel T. Chapman, Artillery, *entered the Army in 1940 and served in Hawaii and ETO during World War II. In Korea he was with 2d Division artillery, later commanded an AA battalion, and is now CO of the 5th Missile Battalion, 1st Artillery, in Europe. He wrote "Balloon Ride Over the Circus" in the April 1956 issue.*

GONE ARE THE DAYS

But Regulations are still with us

MAJOR ROLFE L. HILLMAN, JR.

To Cerebrationists of recent months who have become either indignant or confused over the addition of grades and supergrades to the current noncommissioned officer structure, I submit that there has been considerable improvement during the past fifty years. "Rank and Precedence of Officers and Noncommissioned Officers" that follows is from *Manual for Privates of Infantry of the Organized Militia of the United States* (1909).

The following are the grades of rank of officers and noncommissioned officers:

1. Lieutenant-general.
2. Major-general.
3. Brigadier general.
4. Colonel.
5. Lieutenant-colonel.
6. Major.
7. Captain.
8. First lieutenant.
9. Second lieutenant
10. Veterinarian, cavalry and field artillery.
11. Cadet.
12. (a) Sergeant-major, regimental; sergeant-major, senior grade, Coast Artillery Corps; (b) master electrician, Coast Artillery Corps; master signal electrician; (c) engineer, Coast Artillery Corps; (d) electrician sergeant, first class, Coast Artillery Corps.
13. Ordnance sergeant; post commissary-sergeant; post quartermaster-sergeant; sergeant, first class, Hospital Corps; first class signal sergeant; electrician sergeant, second class, Coast Artillery Corps; master gunner, Coast Artillery Corps.
14. Quartermaster-sergeant; and commissary-sergeant, regimental; chief musician.
15. Sergeant-major, squadron and battalion; sergeant-major, junior grade, Coast Artillery Corps; color sergeant; chief trumpeter; principal musician; battalion quartermaster-sergeant, engineer and field artillery.
16. First sergeant; drum major.
17. Sergeant; quartermaster-sergeant, company; stable sergeant.
18. (a) Corporal; (b) fireman, Coast Artillery Corps.

This same manual makes it clear that the arrival of the flush toilet and an adequate ration has relieved the mind of today's junior commander of two seemingly widespread breaches of discipline. Rules 9 and 12 of the section which follows should inspire some reflective thinking.

The armies of the United States are governed by certain rules and regulations called "The Articles of War."

The Militia [National Guard] when called into the actual service of the United States shall be subject to the same rules and articles of war as the Regular troops of the United States.

When not in the actual service of the United States, the Militia is governed by such rules and regulations as may be prescribed by the State in which the Militia is organized.

The following list includes the offenses most often committed by soldiers, generally through ignorance or carelessness rather than viciousness. Violations of any rule or regulation should be carefully guarded against, since they not only subject the offender to punishment, but also bring discredit on his comrades, his organization, and on the military profession:

1. Selling, pawning, or, through neglect, losing or spoiling any government property, such as uniforms, blankets, equipment, ammunition, etc.
2. Disobedience of the orders of any officer or noncommisioned officer.
3. Disrespect to an officer or noncommissioned officer.
4. Absence from camp without leave.
5. Absence from any drill, formation, or other duty without authority.
6. Drunkenness on duty or off duty, whether in camp or when absent either with or without leave.
7. Bringing liquor into camp.
8. Noisy or disorderly conduct in camp or when absent either with or without leave.
9. Entering on private property, generally for the purpose of stealing fruit, etc.
10. Negligence or carelessness at drill or on other duty, particularly while on guard or as a sentinel over prisoners.
11. Wearing an unauthorized uniform or wearing the uniform in an improper manner.
12. Urinating in or around camp.
13. Failing to salute properly.
14. Disrespect or affront to a sentry.

In preparing for atomic warfare, we are little concerned that our Pentomic soldiers will either steal fruit or commit a nuisance in camp for lack of plumbing. But as an effective reminder of some fundamentals, the rest of the list, as compiled in 1909, might well be posted on the bulletin board of every training company in the Army.

Major Rolfe L. Hillman, Jr., Infantry, *a 1945 graduate of USMA, served in Japan, Korea, and in Europe, and is now on the Faculty and Staff of the U.S. Army Infantry School.*

SHOOTING THE SAFETY FACTORS WITH GELATIN BULLETS

Can't we inject a little realism in small-unit problems?

CAPTAIN ROBERT de MARCELLUS

THE lieutenant in charge of the training wished the briars weren't so thick. They had already caught the inspecting colonel's trousers three times as the two men struggled towards a hilltop overlooking the training area. Hoping the briars would have no adverse effect on the colonel's opinion of the Rifle Squad In The Attack live-fire problem, the lieutenant pointed to the base of the bare objective with wooded areas to each side. "Sir, from here you will see the squad come out into the open."

"Why do they come out in the open there?" asked the colonel, sucking his thumb where it had been snagged by a thorn.

"Safety factor, sir." The lieutenant knew this was an entirely safe answer. He knew this was the correct place for the squad to come out; the path, beaten by innumerable other squads, was plainly evident.

"Where's the squad now?"

"In the assembly area, sir, receiving the attack order." The lieutenant had no trouble selecting the assembly area; it, too, had been clearly marked by past squads.

The colonel wiped his thumb on a handkerchief while he visualized the briefing being given "for the record" by some NCO in a dull, monotonous voice . . . "the enemy situation is . . ."

"Here comes the squad, sir!" cried the lieutenant, delighted that it was on schedule.

Emerging from the "covered route of approach" at an angle to the open swath running up the hill, the squad stopped. One by one the men moved out along the base of the hill until they were in a straight line, obviously the "attack position."

The squad leader, assistant squad leader, and two safety officers moved up and down the line waving their arms and straightening out kinks.

"What are they doing?" asked the colonel with growing impatience.

"Safety procedure, sir, everybody must be on line."

Finally the line started moving up the cleared forward slope of the hill toward the summit a quarter of a mile away. The squad leader fired a green smoke streamer.

"That's the signal to lift supporting fire, sir."

The colonel was about to ask what supporting fire, but restrained himself. Its absence was probably a safety factor.

The men were moving up the hill slowly; they looked small against the expanse of open terrain. The squad leader and the assistant squad leader were screaming at the men to fire every few steps. The safety officers were also screaming. As far as the colonel could understand, they seemed to be telling the men who stopped to fire to get back in line with the others. Little puffs of dirt were kicking up 12 feet ahead of the squad where a BARman's bullets were spraying the ground. A minute later the safety officer had relieved him of his weapon.

"What are they shooting at?" asked the colonel.

"Places where an enemy might be, sir," replied the lieutenant.

To the colonel it seemed that the bare hill with 16 silhouette targets in front of 16 pits left little to the imagination.

Suddenly a machine gun opened fire with blanks from a pit at the top of the hill.

"That must be *the* training aid," the colonel thought.

"That's a machine gun," the lieutenant said happily.

The squad was still shooting and advancing by "marching fire" up the hill.

The colonel knew the next phase; all would meet on the summit and "reorganize." After this they would be marched back and a new squad would assault The Hill.

As the colonel climbed back aboard his jeep he wondered how this "problem" could possibly square with what the men would experience in combat. It was a problem all right.

Now supposing, he cogitated . . . supposing the men had been given blank rounds, loaded with a vitamin capsule type bullet filled with red liquid; supposing the men had worn goggles and had been ordered to capture a position manned by similarly armed aggressors . . . might not they have found for themselves the real covered route of approach? Might not they have felt a real thrill of anticipation as they squirmed through the

brush? Wouldn't they have instinctively realized the value of accuracy as they fired at the oncoming enemy? The gelatin bullet would have a short range, to be sure, but wouldn't the mischievous and adventurous spirit of each young trooper be filled to overflowing as he laid his ambush plans?

Wouldn't night patrols no longer need to be told "it's tactical!" as they inched forward expecting at any minute the sting of enemy fire? Might not umpires be better able to assess casualties? Wouldn't the lieutenant have a new appreciation for terrain and the disastrous fate of a platoon caught in the open by a machine gun during "marching fire"?

Hadn't Hollywood cowboys been firing something of that nature for 20 years? Didn't little boys make excellent "hand grenades" by putting fire crackers in potatoes?

"Absolutely revolutionary!" the colonel muttered as he walked into his office. "Realistic, economical, morale building." Sadly he shook his head as he began to go through his distribution. "Maybe," he thought, "maybe—but long after my time. Perhaps they will have training aids like that for moon warfare."

Captain Robert de Marcellus, Florida Army National Guard, *was an Infantry platoon leader in Korea and is now adjutant of the 160th Transportation Battalion. He heads a public relations firm in Palm Beach.*

THE BEST-TAILORED ARMY

Regulations and the alteration of trousers

CAPTAIN MARTIN BLUMENSON

I was in the Army Quartermaster store. A few days before, I had bought a new uniform for my two-week tour of active duty. I had been pleasantly surprised by the courteous service of the salespeople and the low cost.

Some alterations had been necessary: raising one shoulder of the blouse and shortening the trousers. The tailor said the uniform would be ready in a few days.

It was. I picked up my clothes and took them home. That evening I tried them on. The blouse fitted fine—I looked almost handsome. The pants were just right too—except for the width of the leg. When I took a few steps, the legs flapped.

Was I right? Or was I imagining? Maybe I just felt uncomfortable because I hadn't worn a uniform for such a long time.

I went downstairs to show my wife. "You're beautiful," she said. "All that braid and gold! But stop flapping."

"I'm not flapping. It's the pants."

"That's what I mean."

So I wasn't mistaken.

I took the pants back to the tailor in the Quartermaster store. "They don't fit," I told him.

He told me to go to the dressing room and put them on. I did. "See? They flap when I walk. Like a bird."

The tailor saw it too. He looked concerned. Even worried. "Maybe you're right," he ventured.

I said, OK, I would leave the pants with him so he could cut them down and peg them slightly to take the flap out.

"*Peg* them? You shouldn't mention that word. We call it something else. Sure, we do it sometimes on the bottom a little. But not all the way up the pants leg like you need."

"I'll pay you," I said.

"What do you mean, pay me? I can't do it. Regulations. I'm sorry."

"So how can I wear them?"

He shrugged. There was an awkward silence. Finally, "I'll tell you. I want you should look nice. You bring the pants to my house, and I'll do them for nothing. Here's my card, with the address."

"Can I leave them here with you and you take them home?"

"I'm not allowed. Regulations."

"I'll leave them in your car."

He didn't have a car.

"Can you come over and pick them up at my office?" It was only a few steps away.

He shook his head. "I'm very sorry." Then he smiled. "Why don't you bring them to my house? I'll be glad to do it."

This was out of the question. It was too far. And too absurd.

"Let's start all over again," I said. "I bought a new uniform, and you fixed the blouse and shortened the pants to make it fit right. Correct?"

He nodded.

"Everything fits right except the pants. Right?"

"Right."

"So why can't you take the flap out?

"Regulations."

I tried to keep my voice calm. "What regulations?"

"How should I know? Regulations is regulations," he explained. "We have strict orders. You know how it is." Then he brightened. "But at my house I can do it."

This was getting me nowhere. "All right," I said. "Take me to your leader."

"What? What?"

"Who's in charge of the store?"

"My supervisor. Who else?"

"All right," I said. "Let's go see your supervisor."

"He's a very busy man. Why don't you bring the pants to my house?"

"Maybe he'll see us even if he is busy. Let's try."

He led me to an office. My pants flapped every step of the way. A secretary typing at a desk looked up.

"Please," the tailor said. "We'd like to see the captain. On business."

She turned back to her typing. Permission granted. The tailor led me into an inner office.

The captain was adding up a column of figures. Inventory, no doubt. He turned out to be a nice guy. He understood the problem perfectly. The pants flapped. He sympathized. But there wasn't a thing the Quartermaster store could do about it.

"Take it to a tailor on the outside," the captain suggested.

"But why? You did all the other alterations. Why not this one?"

Like the tailor, the captain shrugged. "We just can't take in your pants. I'm sorry."

I knew at that point it was hopeless. "I'll never understand why," I said. "But thanks anyway." I turned to go.

"Listen," the captain said, and I could tell he was trying to be helpful. "In a way you're lucky. If your blouse was too long, we wouldn't be able to do a thing about that either."

"If my blouse was too long?"

The captain nodded. "Sometimes a blouse is just too long. But we can't touch it. You should see some of the trouble we have with a general whose blouse is too long."

"You can't fix that either?"

He shook his head.

"Probably regulations," I said.

"Right, come back any time."

As we were leaving, the tailor whispered to me: "Listen, I'll be glad to do it. All you have to do is bring the pants to my house."

"But not here."

"Not here. Here I can't do it."

"Regulations."

"Sure," he said. "What can you do? It's nothing personal. You can't fight city hall. Why don't you bring the pants to my house?"

At that moment, near the secretary's desk, I tripped. Over the pants, naturally. I bounced off the metal desk and caught myself from falling by grabbing the wall.

"Careful," the tailor said. "Did you hurt yourself?"

I was all right. But down near the bottom of the right leg of my pants, there was a small rip.

"Look," I said. "How did that happen?"

It must have been a sharp corner of the desk. Or maybe the metal taps I wore on my heels.

The tailor looked. "My oh my. The pants are ruined." Then he got excited. "What am I *saying*, ruined?" He bent down and examined the rip closely. "Ruined, nothing. Are you lucky!"

"I am?"

"Listen. The rip we have to fix, right? Patches we can't do, right?"

"Wait a minute. Why no patches?"

"Regulations. Right? So I have to take up the seam, right? So I have to cut down the pants leg. So I can peg them. What am I *saying*? *Peg* them I can't. But *fix* them I can."

I was a trifle bewildered.

"Captain, Captain!" The tailor was almost running, back to the captain's office. "We can do it! Look, he ripped his pants. So we have to fix them, don't we?"

It turned out that they did.

Captain Martin Blumenson, *USAR, an occasional contributor, is a civilian historian with the Office of the Chief of Military History.*

UNTIE THE TRAINER'S HANDS

A little harassment may be good for the ailing soldier

LT. PERRY W. BROWN

When a small-unit leader, particularly one who is training troops, reads or takes time out to remember that the Army's ultimate objective is success in combat, he may well wonder if here is not a case of two forces pulling in opposite directions.

He is constantly reminded that our national standards of physical fitness are deteriorating. This reminder comes from observing that we are getting too many recruits who can at best do one pull-up or very few push-ups, and who exhibit a general physical unfitness. We are also reminded of this condition through reports of various physical fitness committees and through comparisons of our physical capabilities with those of soldiers in other countries.

Then the trainer considers the limitations placed upon him in producing a physically capable soldier. He trains (herds would be a better term) his charges for eight weeks. During that time the only physical training he is allowed to give his recruits is the amount prescribed by the training schedule. For an eight-week cycle this amounts to approximately 21 periods of 45 minutes each. Any extra physical training he may interpolate on his own is an invitation to a court-martial.

It is beside the point for the trainer to remonstrate that his recruits are in dire need of much more physical training if they are to be brought to even a minimum standard. Additional physical training is considered harassment, and our young men must not be harassed in any circumstance. Give them plenty of physical training, but stay within the limitations of the training schedule!

Army Regulations say that a pass is a privilege and must not be considered a right. Yet how much attention is paid to that proposition? A young recruit gets a pass when his relatives visit him, even though he is the most fouled-up 8-ball in his training unit and a command inspection is scheduled for next day. The soldier's immediate superiors, the trainers who are closest to him, have no say one way or the other. Yet the trainer must answer for the 8-ball's failure to be ready next day.

We pay more attention to incidentals than to training. One hundred per cent participation in savings bonds purchases or soldiers' deposits will be attained, regardless of planned or current personal savings programs. Everyone is *encouraged* to participate in more charity drives than you can imagine. Participation will be strictly "voluntary" the directive says, but we will have one hundred per cent enrollment.

Make sure the range is policed, that packs are lined up perfectly, that you have all trophies out. Ordinarily you would think the primary consideration should be: can they hit the target?

Don't wake your recruits in a class when they doze off. Their instructor put them to sleep; let him wake them up. Besides, to awaken a recruit may embarrass the young man, and consequently be considered as harassment.

It seems to me, a trainer, that it is more important for a recruit to learn the fundamentals of soldiering than to avoid being embarrassed. It seems to me that harassment is immaterial so long as the recruit reaches at least a minimum standard of physical fitness and combat readiness. Since a rifle range is for shooting, I think it more important for a soldier to be able to hit a target than having ammo tables neatly lined up, helmets painted various colors, and all paper policed.

If war comes, it will be too late to start working on physical fitness, marksmanship, alertness, and combat know-how on the part of the individual soldier. Somewhere during his training for these skills we must instill discipline. If war should come, every platoon leader must know for sure that when he gives the order to take that hill, his men will take that hill, whether or not it seems feasible to them.

These objectives can be attained simply by removing unnecessary restrictions from the trainer. It behooves us to do it right now.

Lieutenant Perry W. Brown, Infantry, *a graduate of Howard University (1950), served with the 3d Armored Division in Germany and was commissioned from OCS in 1958. He wrote "Give the Noncom His Head" in the February 1957 issue.*

THE AIR-CUSHIONED KNOCK

Master Sergeant FORREST K. KLEINMAN

The promise of land mobility beyond anything previously dreamed of is offered by vehicles that use compressed air as a cushion

THE long-sought opportunity to leap-frog the Soviet Army in the evolution of tactical mobility appears to be at hand. If we vigorously exploit it, Russia's 70,000 modern tanks and highly touted mechanized divisions may become as obsolete as the horse-drawn war chariot and the phalanx.

The opportunity is presented by a technological development that has been hailed as the most significant innovation in the mechanics of locomotion since the invention of the wheel. It is the development of the compressed air cushion for vehicular movement over both land and water.

Employing this radically new principle, vehicles as heavy as 40 tons can carry large payloads at speeds exceeding 100 mph. So claim pioneer developers here and abroad, and their claims are supported by recent press reports of prototype performance.

Neither airplane nor helicopter, these novel craft operate most efficiently at altitudes measured in inches rather than yards. High speed and fuel economy are possible because the supporting cushion of air is virtually frictionless.

The cushion is created by jets of air directed down and inward by multiple nozzles on the rim of the hull. Source of the airflow is a ducted fan operated by a motor of relatively low horsepower. Forward propulsion and speed control are obtained by diverting part of the airflow through horizontal ducts. (See diagram)

Naturally official plans for military use of this revolutionary innovation are classified. To date, there has been no announcement by the Department of Defense that would indicate development for military purposes has yet reached the field-test stage. But a statement by Lt. Gen. Arthur G. Trudeau in the June issue of *ARMY* speaks for itself of the United States Army's interest:

"With the exception of some observation and transport craft, it now appears feasible to develop air vehicles that can actually replace some of our ground vehicles. These will not be 'high flyers' but will only have to get up a few feet above the surface to do the job. Once off the ground, these vehicles will no longer be subject to the barriers and obstacles that have impeded movement in the past. The ground will become a true ally, screening movement and protecting troops without hindering them."

Earlier this year, William H. Alper, president of the National Research Association Inc., told the House Committee on Science and Astronautics that a full-scale one-ton "flying tank" would be ready for evaluation tests this summer. He said it will be capable of traveling sixty inches above land or water at speeds up to 200 mph.

Before the same Congressional committee, Carl W. Bollum Sr., president of "Spacetronics," testified that a cargo carrier capable of carrying a 40,000-pound load 30 inches above the surface of land or water also would be ready this summer. In view of the Army's stringent budgetary limitations, Mr. Bollum's reference to cost is highly encouraging. He said that a 6-passenger sports car, capable of carrying 1,000 pounds of luggage at

A flying scooter, capable of speeds up to 15 mph while traveling a few inches off the ground, has been demonstrated by Princeton University's James Forrestal Research Center. The 120-pound aluminum-fabric vehicle, which is operated by a five-horsepower engine, was developed under a $100,000 grant from the Army Transportation Corps' Research Engineering Command. The operator's equipment consists of a bicycle seat and handle bars, and the machine is guided by the weight of the operator's body, as is a bicycle. The engine powers a small propeller which forces air at speeds of 30 mph through a duct and into the body of the vehicle. There the air is shot through a narrow opening which rings the base of the vehicle and is angled inward beneath the base. The machine has six times the lifting power of a helicopter.

Master Sergeant Forrest K. Kleinman, a regular contributor, is on the staff of the Public Information Office, USCONARC.

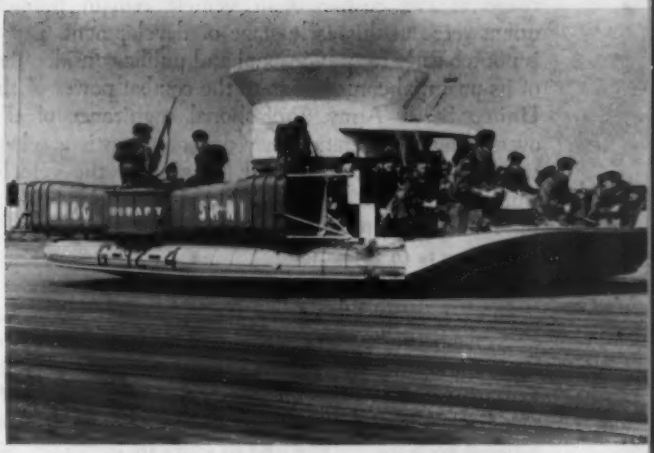
OF OPPORTUNITY

speeds over 100 mph, 24 inches above land or water, can be retailed for only $4,000.

Officers in the Matériel Developments Section of Headquarters USCONARC caution, however, that there is a big gap between technical feasibility and combat fieldability. At the normal pace of matériel development it might take a decade or more before vehicles incorporating the cushion of air principle would begin to flow to units organized and trained to use them in battle.

Cogent reasons are offered for such a time lag. From concept to mass-production roll off, the typical matériel development cycle includes 15 time-consuming steps. Their need is indicated by past experience with hundreds of thousands of items.

With aerial vehicles of all types, the problem of maintenance is particularly acute. So far there is no indication that air-cushion vehicles for military use will require less maintenance than helicopters of comparable size. In view of our current difficulty maintaining a relatively small number of helicopters, the possibility of large-scale adoption of the air-cushion vehicle as a replacement for many tracked and wheeled vehicles poses



British-developed Hovercraft is a test of the air cushion lift principle. Photo below shows Hovercraft rising off runway during ground effect demonstration. In photo above it is lifting 20 fighting men, plus two-man crew. Hovercraft, built by Saunders-Roe for the British National Research and Development Council, uses a peripheral jet air momentum curtain to seal the supporting air. The power plant is a 435 hp piston engine. (Photo by *Aviation Week.*)

a thorny question: In the teeth of personnel reductions and losses to industry, where will we find sufficient trained mechanics to meet the drastic increase in our maintenance requirement?

Many other practical questions regarding military usage of the cushion-of-air vehicle remain publicly unanswered at this early stage of development. But it is not too early for professional and public consideration of its potential contribution to the combat power of the United States Army. Professional cognizance of this over-riding consideration may dictate a drastic acceleration in the development and adoption of the vehicle. Public cognizance can stimulate the effort and produce the money required.

The race is to those who recognize valid innovations

In all military history, no nation has ever lost a war or even a battle by premature adoption of a technological innovation in firepower, mobility or communication. But many a war has been won by the nation whose military leaders were *first* to recognize the military applicability of such innovations and to adopt them.

In 1911, an Austrian Army officer submitted an excellent design for a tank to both the Austrian and German war ministries. Neither saw any need for such a vehicle. Not even the bloody stalemate of trench warfare four years later awakened their interest. Only after the British employed tanks against them in combat, did the German High Command endeavor too late to correct their mistake.

During the Civil War, our War Department steadfastly refused to adopt the Gatling Gun with an 800-round per minute rate of fire. In desperation, Gatling hired civilian crews and demonstrated the weapon's revolutionary firepower in battle. But Union military leaders still failed to recognize its military potential!

Failure to properly employ a technological innovation has also proved costly to nations in the past. Prior to the Franco-Prussian War, the French Army adopted the mitrailleuse—a multiple-barreled gun, capable of firing 370 rounds per minute. Instead of using it at close range as an infantry weapon, the French employed it as an artillery piece for long-range support. Thus, the tactical revolution effected by the machine gun was postponed more than a half century.

Today there is no doubt that American military planners recognize the need for tanks, personnel and cargo carriers having the speed, cross-country and amphibious characteristics of the air-cushion vehicle. Our combat development program of organizations and tactics for ground operations in the 1970-80 time-frame has long assumed that vehicles with similar characteristics will be available. Without them, the concept of fluid operations conducted by small, self-sufficient mobile forces in a battle area of great depth would not be feasible.

In the opinion of some military theorists, our present concepts for increased dispersion on the atomic battlefield are unrealistic and will remain so until we find a way to increase our tactical mobility. This increase is overdue. Today's road-bound divisions have yet to exceed the speed of movement attained by the pedestrian Roman Legion!

So it's not a question of will the air-cushioned vehicle revolutionize ground operations. The question is when?

The answer has implications far beyond the realm of tactics. It can alter our national defense posture and our entire military-diplomatic situation.

As matters now stand, our government has no honorable choice but to lay our national survival on the line when the Reds threaten to move a pawn—as in Formosa, Berlin, and the Middle East. We know that the threat of nuclear annihilation is now mutual, yet we continue to rely upon massive retaliation as our all-purpose deterrent to armed aggression.

Consider how different our situation would be if we had the tactical tools to assure speedy defeat of any ground force that the Communist bloc could field against us! Our defense posture would regain balance. Our national strategy would regain flexibility. Once again we would have a choice of timely responses—the capability to apply force appropriate to political objectives. Possessing the ability to accommodate our strategy to the Communist strategy of limited objectives, our deterrence to limited war would become much more convincing to the enemy and much more acceptable to our friends.

To leap-frog the Soviet Army with forward-looking tactics

To achieve this by a modernization and expansion program that would enable us to outnumber (or match) the Red Army with weapons and equipment *in kind*, would be prohibitively expensive in money and time. Nor can a development program which produces qualitative superiority in kind assure tactical superiority. For example: a slight edge in performance by our medium tank over the Soviet medium tank would never off-set the great disparity in numbers which confronts us.

Only by a revolutionary advance can it be accomplished. Only by leap-frogging the Red Army in tactical evolution can our combat development program provide the superiority we seek.

The air-cushion vehicle offers us this opportunity!

It is not enough that our Army recognizes the military potential of this technological innovation. The American people and their representatives in Congress must recognize what is at stake. Otherwise development and *production* will receive insufficient budgetary emphasis.

By spending just a fraction of the billions that the Soviet Union has invested in modern tanks, we could render them obsolete. Just a fraction of the money and effort devoted to the crash program for developing the A-bomb in World War II could avert the tragic consequences of a thermo-nuclear World War III.

More than a thousand years ago a wise man of the East penned a warning appropriate to this time and task:

"Four things come not back: The spoken word; the sped arrow; time past; *the neglected opportunity*!"

The thesis advanced here is that today, as in the past, technology is the servant of the commander-tactician

IS THE DOCTRINE PERTINENT?

Lieutenant Colonel JOHN B. B. TRUSSELL

IN Korea an antiaircraft artillery gun battery for many months occupied an on-site position atop a hill. It was a very high hill, and across its almost precipitous face the narrow access road from the valley below twisted steeply in a succession of hairpin turns. Getting the guns up that hill must have been a harrowing task, even in good weather.

However, as time passed, the men who remembered how it was done finished their tours and went home. New men marvelled at the skill of their predecessors and speculated about how the guns had been gotten into position.

And then, during the rainy season when the access road was inches deep in slippery mud, came a day when two of the guns had to have specialized repairs. It was impossible to do the work at the battery position, so the guns had to be taken to ordnance. Furthermore, the repairs could not wait. Slippery road or no, the guns had to be taken to ordnance *now*.

Greatly troubled, the battery commander considered his problem. His prime movers were old and worn. Even under ideal conditions, it would be difficult to use them to take the guns down the hill. But conditions were far from ideal, and to use the prime movers now would be to run an unacceptable risk of losing tractor, gun and driver in an especially messy type of accident.

Getting down to the root of the matter, the battery commander realized that, even with judicious use of winches and cables, a tracked vehicle would not be enough. What he needed was a tracked vehicle which, at the first sign of slipping, would anchor itself firmly.

It was that word, *anchor*, which led him to the solution. He would borrow a bulldozer from the engineers, and use that as a prime mover; if it started to slide, it could be braked by digging its blade into the ground.

That is what he did, and it worked.

Lieutenant Colonel John B. B. Trussell, Jr., Artillery, was commissioned after graduating from the University of Minnesota in 1942, and integrated into the Regular Army in 1946. An occasional contributor, his latest article was "New Tactical Tasks for Antiaircraft Artillery Automatic Weapons" (April 1958).

Analyze the problem

While this anecdote deals with a rather mundane problem, it illustrates an important point. The battery commander's first step in solving his problem was to analyze it carefully. When the nature of the problem was correctly determined, the requirements for its solution suggested themselves, particularly since the battery commander used his imagination to think beyond purely customary means. In brief, he got down to fundamental needs and fundamental capabilities.

This approach has an application across the entire spectrum of military concerns. Today, the need is more important than ever for realistic, objective analysis of military problems without the bias resulting from fixed preconceptions or slavish habit. Scientific progress has brought such enormous advances in military capability that in a number of respects they are confronting us with problems that are completely unorthodox and which cannot be solved by resorting to precedent.

Not only is it necessary to blaze new trails in our thinking; it is equally necessary to take a long, hard, critical look at some concepts we have come to take for granted. Such a look is especially called for with respect to those concepts which are so firmly entrenched that they are regarded as articles of faith—accepted unquestioningly, whether or not they can be supported by reasoning. There can be no place in modern military doctrine for procedures or methods which are justified solely by traditional practice.

Underscoring the importance of objective analysis of military problems, especially when the possibilities are so radical, is the fact that the effectiveness of matériel can be no greater than the effectiveness of the methods through which it is employed. As a gadget-minded people, we are prone to subordinate this consideration. We tend to attribute progress very largely to technology.

It should be kept in mind, however, that technology has not so much *caused* rapid, revolutionary changes in warfare as it has *made such changes possible*. This distinction is sufficiently important to deserve some fairly detailed development.

Since the introduction of gunpowder, there have been quantum jumps in military technology apart from jet

aircraft, the nuclear weapon, and the guided missile. Among them could be listed the rifle, the explosive projectile, the rifled cannon, the metal cartridge, the needle gun, the machine gun, the hydropneumatic recoil system for artillery, the submarine, the substitution of coal for sail and of oil for coal in warships, the airplane, the tank, the radio, radar, and the internal combustion engine. There are many others.

In each instance, the ultimate effects have been extensive. Yet the great, dramatically sudden turning points in warfare have seldom been due to one belligerent's introduction of a new device. Indeed, the record of the initial uses of new military hardware is notable for a lack of appreciation of the full potentials of the new capability, and for a consequent failure to integrate it into total resources so as to achieve the fullest possible result. The German introduction of poison gas in 1915 and the early efforts of the British to employ tanks are prime examples.

Potentials must be recognized

When major, dramatically sudden developments in warfare have occurred, they have tended to be due to new methods, not new matériel. A commander has seen in a weapon or a combination of weapons a possibility which everyone else has overlooked, and has exploited it to his own success.

Napoleon was not the first commander to use artillery. However, he was one of the first to recognize the value of massed firepower and to create a mobile artillery reserve so as to be able to concentrate his most devastating weapons where they were needed.

In more modern times, the Blitzkrieg with which the Germans electrified the world twenty years ago was not based on the sudden availability of new weapons and equipment but, like Napoleon's artillery reserve, on a new and vastly better *concept* for employing existing weapons and equipment.

By the same token, it was an improved concept, not new matériel, which led General Patton to carry out his daring dash across France in the summer of 1944, with only tactical air and guerrilla forces to protect his exposed right flank.

In brief, the achievements in warfare which have been notable for the impact of their startling newness have actually been due, for the most part, not so much to the introduction of new weapons and equipment as to the introduction of significantly better methods of employing those already available.

Today there is a special compulsion upon us to develop the full capabilities available to us. Many of the basic tools which we would employ in war have not been tested in battle. And to a degree without precedent in our history, our ability to employ them skillfully from the outset of a war could determine our chance for success—possibly even for survival.

I'll grant it is easy to say that clarity of vision and penetrating solutions are important. There remains the very difficult question of how to achieve them. The difficulty of arriving at an answer to this question is complicated by the natural human tendency to cling to the familiar, and by the fact that the extensions of capabilities brought by technology are so radical that in many instances they stagger the imagination. In such circumstances, it is dangerously easy to accept the line that the only effect of the changes is to permit the same old tasks to be carried out by the same old methods, only more easily and more effectively.

To accept this line, however, is to risk falling into the error for which C. S. Forester, the military historian and novelist, once condemned the British generals of World War I. He compared them to savages confronted with two pieces of wood which had been screwed tightly together. While the savages used great cunning and strength in their effort to pry the pieces apart, they could have achieved the same result more easily, more rapidly and with much less damage had they known enough to use a screwdriver.

The answer we need is to be found in the same type of approach the battery commander used in bringing his guns down the hill. Basically, that answer is the application of a simple formula; that is, to consider what can be described as the object of the action. To a soldier who thoroughly knows the capabilities of his resources, proper identification of the objective will suggest the best means of achieving that objective. Determining the objective and its character in any given instance requires careful thought, but it should be feasible through analytical consideration.

Eliminate preconceptions and prejudices

In determining how the nature of the available resources permits them to be applied, alone or in combination, so as to achieve the objective most effectively, it is essential to eliminate preconceptions and prejudices. I do not say we should discard established principles. On the contrary, they provide the only firm values which are valid regardless of the unorthodox novelty of new capabilities. However, one caution must be observed in this process. We must recognize that, for convenience, many immutable truths have come to be known by stereotyped terms or phrases which do not describe the *conditions* represented by the principle in question as much as they describe the *means* through which, traditionally, those conditions have been sought.

For example, there is the principle of what is often called Mass. Too frequently, Mass is visualized as the concentration of troops. Less frequently, but more accurately, this particular principle is expressed as "superiority of force," but again there is the risk of equating "force" with masses of soldiers. For clarity of thinking, the principle might better be described as "superiority of *combat power;*" further, it should be recognized that, with qualifications concerning its ability to dominate thoroughly and with discrimination, "combat power" may sometimes (even though not invariably) be measured in terms of firepower.

Similarly, there is the principle of Maneuver, which is too often used synonymously with Mobility. Maneuver can be described as the shifting of combat power; thus, achievement of the condition referred to by the term is by no means restricted to the physical movement of troops.

In the battle of Buena Vista, General Zachary Taylor shifted Bragg's battery from the left flank to a threatened point, thereby giving enough weight to the hard-pressed infantrymen to enable them to hold the attackers and hurl them back. General Taylor was employing the principle of Maneuver (in terms of physical movement) so as to be able to apply the principle of superior combat power (in terms of firepower) at the critical point of the action. Mobility in this literal sense had to be used because the range of Bragg's guns was too limited to permit them to engage any target more than a short distance from their firing position.

Suppose Bragg's battery had been armed with modern artillery. The distance involved was about 17,000 yards, well within range of many cannon today. A modern cannoneer would achieve the same effect merely by twirling a few handwheels. Furthermore, while he would do so without the drama of a battery moving into action at the gallop, he would obtain his result more quickly and more effectively. The essential difference, therefore, is in *method*, based on the increased capability of the modern weapon; but the *condition* represented by the principle sought is identical.

When is doctrine valid?

It may be stretching a semantic point to argue that range could therefore be considered a measure of mobility. After all, a principal effect of increased range has been to extend battlefield dispersion. Relatively speaking, therefore, maneuver in terms of physical movement is at least as important today as it was at Buena Vista. Nevertheless, it is fundamental that it is possible to maneuver fires as well as bodies of troops.

In this connection, it would of course be wrong to regard firepower and mass as being invariably synonymous. Attainment of actual superiority of combat power may well depend on many elements other than the lethality of the firepower which can be brought to bear. In any particular situation, these elements may include such factors as discrimination, accuracy, penetration, and the ability of the type of firepower to achieve and maintain domination over the area in question.

The fact remains, though, that the condition which is sought must be recognized for what it really is, not viewed as a stereotyped image; and the means of achieving it must be chosen in terms of the capabilities actually available, not in terms of past methods simply because they are customary.

It is possible that such an approach will raise questions regarding the continuing validity even of some of our most time-honored concepts.

As an example, consider the pre-eminent tactical value which our doctrine assigns to "the high ground." Essentially, the value in the high ground is that it provides superior observation and facilitates our domination of the enemy by fire. We need the high ground to extend *our* capabilities and to prevent the enemy from using it to extend *his*.

If new weapons and equipment could give us more easily or more effectively equivalent or greater capabilities, and if they could make it possible for us to deny an enemy any advantages of holding the high ground, then the high ground *as such* would have lost its reason for importance. At the same time, until new weapons and equipment can accomplish these ends, high ground will lose none of its significance.

It is not my purpose to argue whether or not high ground has particular tactical value. The propositions being advanced are that any doctrinal tenet is valid only so long as it is pertinent to actual requirements; and that the drastically extended capabilities which are available or which can be foreseen raise legitimate questions concerning the continued validity of even some of the most revered tenets of doctrine. In many instances, it may well be that the influence of modern weapons and equipment on methods of operation is one only of degree, not of substance. However, if this is true, it must be reached as a conclusion, not assumed as an initial premise.

A time for rigorous critical analysis

Today, great efforts are being made to assess realistically the extent of our Army's new capabilities, to develop tactics which will make the most of those capabilities, and to adopt forms of organization to make the improved tactics feasible. All these are healthy signs.

While these efforts will result in continually improved doctrine, it is equally necessary for each officer, in his own thinking, to develop the habit of objective, critical analysis. Even in time of peace, published doctrine can seldom keep abreast, in every detail, of the latest technical capabilities. The soldier who first realizes a new capability—and applies it—will have a substantial advantage. Furthermore, the dispersion which will prevail on the battlefield of the future will require independent decision by commanders of even relatively small units. If they are to exercise this decision with the wisdom, imagination, penetration and objectivity which are vital in the face of the unprecedented circumstances which will arise, they must follow the example of the battery commander on the Korean hill and seek solutions which strike to the heart of the problem.

To achieve that purpose, there can be no better starting point than to establish firmly in our minds the object of the action. Doing so will point more clearly to the uncharted way that lies ahead. Doing so will also help us avoid the difficulty which faced the Australian aborigine who, having made himself a new boomerang, found it impossible to throw away the old one.

In Defense of

Lieutenant Colonel JOHN T. CARLEY

GENERAL S. L. A. Marshall's defense of young America* states in his usual clear, direct way a trend that does indeed demand serious thought and responsible action. He has called for help in this cause "wherever he can get it." General Marshall is a hard man to help when it comes to setting thoughts on paper but here, for what it is worth, is my effort to do so.

From 1953 to 1956 I was a planner and course evaluator for Basic Infantry Officer Courses at the Infantry School. During these three years more than ten thousand newly commissioned ROTC and West Point officers passed through the basic courses offered at Benning. These men, recent college graduates all, came from every part of the United States. They represented hundreds of colleges and universities large and small. They came from homes ranging from that of Dr. Milton Eisenhower to the other end of the social and economic scale. I watched these youngsters come and go in a steady stream. Some arrived in heavy soled brogans or high-heeled cowboy boots and others in patent leather dancing slippers. Some carried switch blade knives and some had Bibles. We had panty raid experts, teen-age gang leaders, conscientious objectors, and student body presidents. There were outstanding college athletes and there were dead-beats and physical incompetents. Fort Benning was and probably still is "Cross Section, U.S.A."

Not long after this invasion, tongues began to wag. These new college graduates just didn't have it. They couldn't carry responsibility as in "the old days." They couldn't add or multiply. Their morals were open to question. They drank too much and drove too fast. They had forgotten how to walk or run because they all had cars. They had no conception of the idea that freedom is not free and that even they might be called upon to pay for the privileges that they took so lightly. They were physically inept and, in fact, downright weak. They were discourteous in the presence of rank or advanced age. They were fresh toward women.

It was easier to accept these charges than to dig up a defense against them.

During the summer of 1953 I joined one of these early classes of two hundred new college graduates on the day of their arrival and remained with them until they departed twelve weeks later. I watched them at work and at play. I looked particularly for these many faults which people my age and older were so freely attributing to these men. I looked and I found these faults. I found them in about the same or perhaps in slightly lower ratio than I remembered in my own college class and in other groups of my generation. For every basic officer student who couldn't hold his liquor or had some other weakness I could provide the name of his counterpart from among graduates of earlier, "stronger," groups.

They were hungry for responsibility and grabbed the ball every time we had the guts to give it to them; which was not often enough.

If anything they were better educated, or at least better informed, than I remembered earlier graduating groups as having been. Some of them were not sufficiently competent in mathematics to handle the map reading course; neither were several of the outstanding combat commanders of my acquaintance.

PERHAPS they were not sufficiently aware that freedom carries a price tag. This is always hard to judge. It is not their way to do a lot of talking about such things. They didn't. But there was a happy-go-lucky assurance about them which seemed to cover a wonderful

* See "Pork Chop Hill Five Years After," ARMY, July 1959.

Young America

reservoir of resiliency that takes a man up those last fifty yards and over the top. Surely there were fewer critics qualified to judge these youngsters than there were critics in the judging business at the time.

There were physical specimens ranging from a professional football player on down the line. They were soft, for sure, but they could be hardened up quickly as many of them learned later in ranger and airborne courses. They were polite and courteous in a new and relaxed sort of way in the presence of authority but they did not shake at the knees and lose control of part of their faculties—a reaction which ome holders of rank seem to cherish.

It is true that an easier relationship seemed to exist between men and women. They talked in a language that was hard for a person over thirty to understand. They were quicker to make the flirting passes which girls provoke. They no longer negotiated carefully for six weeks to arrange a kiss (I don't remember this ever having been the case but I have been told by some of the lovers of the good old days that six weeks was par for the course). Just what this freer association between the sexes means I am not sure. Whether it is good or bad I do not know. I do not believe that as a group they were guilty of being fresh.

They were damned little impressed with long lectures about obvious points or about subjects which demanded action. When stimulated, they could be as keen and searching as any group of 21-year-olds. They were quick to criticize. This is always the case with men of this age group who see things so clearly (not so completely) and have such an abundance of energy to put behind their beliefs. Their criticism led to several quick changes in our ways.

I CAME away from my exposure to these en thousand new college graduates convinced of two things. One was that the college graduate of today is unlike the ones turned out a few years ago. The second was that these young Americans are as strong as young Americans have ever been and perhaps even stronger. It is hard to convince a company or battalion commander of this second conviction if he ha gotten one or several of those misfits I mentioned. He is likely to join in that exciting social fad of condemning all college graduates who came after him and cite as substantial evidence the few failures he has seen. This is dangerous. It is most unwise to ignore the unhealthy rends among our young people of today. These failures should rank high among the concerns and actions of responsible adults. But it is also a serious pitfall to lose our perspective because the mistakes of the young receive so much publicity. We must balance our concern with their errors against a healthy respect and active support for their strengths. We have an obligation to search for truth about young America and to counter vicious gossip and fads based upon half truth or partial evidence. Young America needs our faith today as never before. Those clingers to that will-o'-the-wisp, "the good old days," should look seriously at this mythical period and make certain that they really do wish to spend their energies in that historically futile pastime of turning back the clock. These energies are better directed toward the future, toward channeling the abundance of ideas and strength of our young men along lines that will do the most to insure the freedom which we champion for all men. I for one will ride with these young men who are so different yet, in my opinion, so strong.

I first began observing these men of whom I have written in July 1953. Unknown to me then, or for several years, my conclusions had been confirmed before my observations were really begun. In mid-April 1953 young America wrote its own conclusions on Pork Chop Hill.

A MOVING TARGET FOR

Captain JOSEPH J. ADDISON and Major ARCHIBALD V. ARNOLD, JR.

AN Aggressor armored column has broken through your battle group's perimeter. You order your 105mm howitzer battery to remain in place in order to give depth to your antitank defenses. Three Aggressor tanks show up on your left front at about 1,500 meters and clank across to the right at about 15 miles an hour.

Chiefs of sections bark firing commands and the battery opens. All six howitzers miss. The tanks reply, taking advantage of folds in the ground to fire from hull defilade. Three more tanks appear on your left at a range of about 1,000.

The first three establish a perfect base of fire for the second two, now bearing down on your battery as fast as they can move. When they get within 800 meters their machine guns open and your cannoneers begin to fall. Two tubes go out of action. Before you realize it you've been overrun, half your men are casualties, and the rest are in Aggressor's bag.

In the POW compound you have plenty of time to reflect on your recent experience with direct fire. Unfortunately, neither you nor the other survivors of your battery will ever have the opportunity to pass on what you learned the hard way. It's too late to teach your men to hold their fire until tanks are within a range of 600 meters. Too late to train them to deliver rapid, accurate, direct fire at moving targets. You, their commander, knew that direct fire with HEAT shell cannot be delivered accurately beyond 600 meters because of the substantial arc in the trajectory. You learned at great cost what you should have known well: men must be trained before battle to do what is expected of them once they are committed.

Of course, all this is fictional, but it could happen. Every gunner in the artillery can be taught proper methods of direct laying.

Maybe you slight your direct-fire training because of inadequate range facilities. More than likely your gun sections manage only a few hours of sighting and tracking, and during a year fire perhaps a dozen rounds at a stationary target. Until lately, even Fort Sill lacked a realistic range with moving targets that could suddenly and

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Captain Joseph J. Addison, *Armor,* and **Major Archibald V. Arnold, Jr.,** *Artillery,* are on duty at the U. S. Army Artillery Board at Fort Sill.

DIRECT FIRE

unpredictably change direction.

Not long ago, during a test by the U. S. Army Artillery Board, we needed such a direct-fire target range. The existing moving target traveled only a straight course across the range in front of the gun position. We wanted a moving target that could reverse direction without stopping, and could, without warning, emerge from cover in an unexpected direction.

As sometimes happens when exploring a new field, we arrived at the solution the hard way. No one at the Board was familiar with the directions for using the Target, Ground, Fast Moving, M2. The only reference we discovered on targets (TM 9-855) doesn't mention the M2. The materials necessary (target sled, sheaves, wire rope) remained on hand from a previous direct-fire project. It was not until our project was completed that we ran across the standard nomenclature list which gives the title of the kit and lists its bill of materials.

We laid 10-inch sheaves on their sides and fastened them to the ground with metal pins in the pattern shown in *Figure 1*. Next, we had to devise a positive means of freeing the towrope before the sled overran the sheave.

After some experimentation we stumbled onto the natural solution. The rope pulls up and off the sheave as the sled approaches *(Figure 2)*. The sled is then free to slew around and move toward the next sheave. One zig in our course crosses a gully deep enough to conceal the target. The effect is most realistic as the target disappears, then suddenly reappears moving in a new direction.

The target sled is quite mobile over rough terrain even when it carries a non-standard 6 feet by 13 feet panel target. At various times we tried an M8 tractor, a 5-ton truck, and an armored personnel carrier to tow the target. A radio at the gun position and another in the tow vehicle provide the communication necessary to control the target.

Before the target reaches the last sheave, the tow vehicle stops, drops the far end of the towrope, returns to the sled, hitches onto the towrope and threads it back through the sheaves in the proper order. A second vehicle tows the sled directly across to the starting point. During this unavoidable delay the next gunner can sight on and track the target in a dry run.

One advantage of this system is that the length of the tow course is limited only by the length of the towrope and the number of sheaves. Our course is constructed in a 700-mil sector. The target starts from the left at a range of 500 meters and finishes at the right at a range of 350. Although at that range the sector is only 300 meters wide, 6,000 feet of rope and five sheaves permit two to four minutes for sighting and tracking per target course at speeds of from 2 to 15 miles an hour.

Another factor which tends to discourage direct-fire training is the high percentage of wasted time. Delays for repairing targets frequently exceed the useful training time. We used 105mm TP-T shell, and kept a spare sled standing by at the firing point. This resulted in fewer damaged targets and less time lost in replacing those that were damaged. We trained 16 gunners in 12 hours on this range. Each gunner fired 20 rounds or more at a high-speed, elusive target. Chiefs of sections were continually confronted with an interesting problem in computing lead.

Here is the answer to the efficient use of your annual allotment of target-practice training ammunition. Whether you use 37mm subcaliber devices or the standard 105mm, you can turn out crack gunners in short order and have fun doing it at the expenditure of only a few hours. The bill of materials is in ORD 8 SNL-L-9.

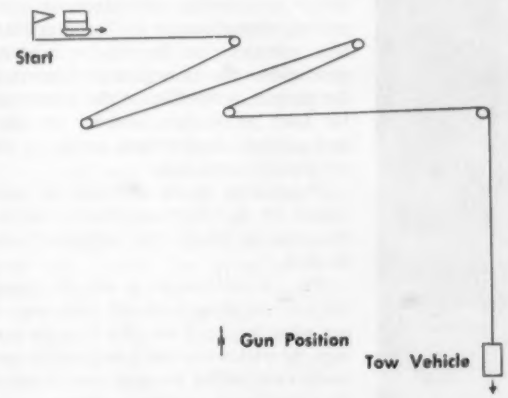


Figure 1

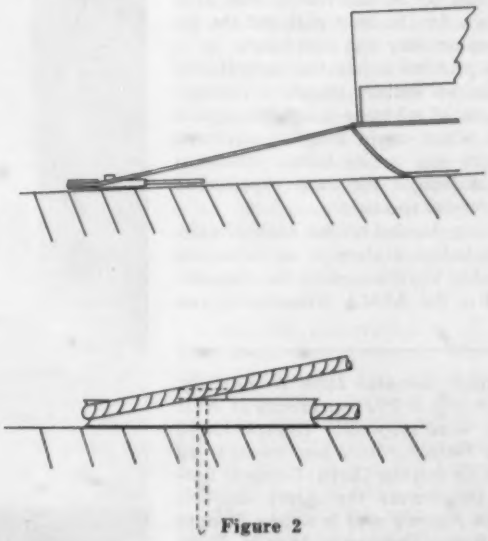


Figure 2

A PATTERN FOR FUTURE DEVELOPMENT

HOW THE ARMY EXPEDITED PROCUREMENT OF THE JUPITER IRBM

Brigadier General JOHN A. BARCLAY

A COMPLEX MISSILE SYSTEM requires a large number of components. They must be available at specified points at pre-determined times in order that development can go forward on an orderly but accelerated basis. National procurement in the developmental phase of the Jupiter Intermediate Range Ballistic Missile system was expedited by methods which may serve the Army to advantage elsewhere.

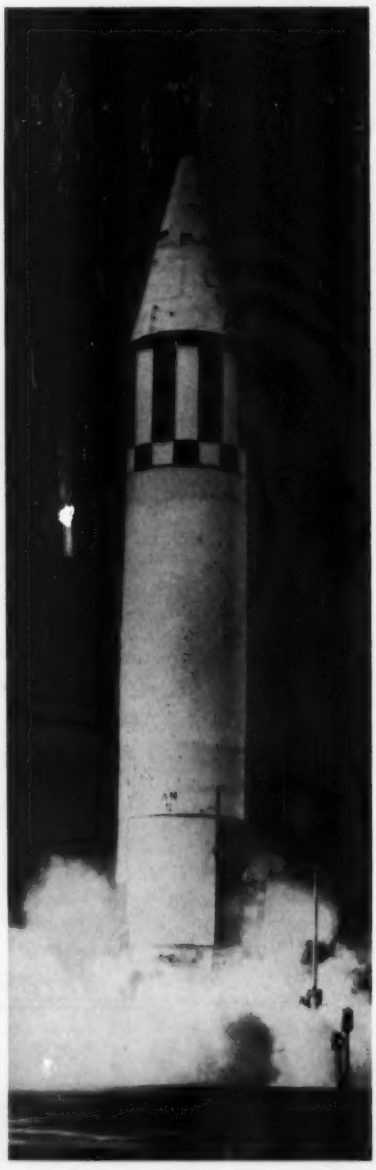
Two factors lent impetus to the urgency with which the IRBM program was conducted by the Army Ballistic Missile Agency, activated in February 1956 under the command of Major General John B. Medaris. These were the factor of obsolescence and the speed of design modifications dictated by exhaustive laboratory testing, static testing and the prototype launching experience.

The requirements compelled the telescoping of normal procurement procedures. As a result, contractor operations had to be covered by cost type contracts for the most part and the desired commodity was man hours.

The problem was further complicated because we initially bought a concept. The task of selecting a capable organization which could translate advanced concepts into reality within scheduled time challenged the most experienced procurement specialist.

Having decided on the basis of careful technical evaluation of what we wanted to buy, these were the steps followed in the ABMA procurement system:

Brigadier General John A. Barclay, U. S. Army, a 1931 graduate of West Point, was originally commissioned in the Field Artillery and transferred to the Ordnance Corps. General Barclay commands the Army Ballistic Missile Agency and is Acting Deputy CG, Army Ordnance Missile Command at Redstone Arsenal.



- A complete review of resources files which list potential sources throughout the country was carried on within ABMA's Industrial Division.
- A task force was established which was made up of technical personnel well versed in the major specialties involved in the project under study, augmented by industrial engineers and procurement experts.
- A complete physical survey of potential suppliers was conducted by the task force. Prospective contractors were furnished as much detailed information as possible to guide them in submitting proposals.
- ABMA evaluated the proposals and, whenever necessary, further investigated the facilities and engineering capacity available in contractor organizations.

Criteria of evaluation

In the final determination, these criteria entered into the evaluation: availability of resources in engineering manpower, adaptability of the facilities available, efficiency of the procurement organization, top management interest in the project, suitability of the contractor for later production, absence of other and current development contracts for top priority programs.

Negotiation of the contract was conducted by the Ordnance District serving the area in which the contractor was located.

We did not assign a job to a contractor and then walk off and wait to see what he could do. We brought him into the picture as early as possible and made every effort to assist him to attain the objective in minimum time.

One of the means to the end was a network of ABMA Action Officers established in every procurement agency. Their task was to be familiar with every action allocated to their offices by ABMA. They conducted vigorous follow-ups covering all phases of the action

from the placement of the contract to delivery of the end item. The action was never permitted to move itself. If the situation warranted, "public exigency" was applied.

This watchdog operation reduced administrative lag time substantially. The interval between allocation and contract placement was sliced to an average of two weeks—a single week in many cases.

At the inception of the Jupiter program the Secretary of the Army delegated unusual authorities to General Medaris. These authorities were used sparingly and only when vital delivery schedules could not be met by normal procurement. In the first year of operations, delegations were applied in about 12 per cent of the major procurement actions. When they were used some actions were completed within hours. The time saving averaged 60 working days per action.

The significance of this was that it demonstrated an all-out effort to complete a high priority task can be successful in the peacetime economy without retreating from the Government's high standards. Future "crash" programs may well benefit from the pioneering efforts of ABMA.

Contract alterations by supervisors

Technical supervisors were installed in the plants of major contractors and sub-contractors. They could alter contracts in some respects with written approval of the contracting officer. For example they could:

- Make changes within the general scope of the contract in drawings, design, specifications, and parts lists.
- Direct a contractor to deliver any item in the state of completion then existing and excuse him from further work.
- Adjust component allocations.
- Direct modification of missile components previously delivered to and accepted by the Government which were furnished to the contractor for modification.

This eliminated delays which otherwise would have occurred if each technical request for change in missile assembly and fabrication had to move through normal channels. Quick decisions were possible by the presence of qualified personnel at the work site. As a safeguard their activities were controlled by the parent organization to insure that they keep within the confines of the program and the terms of the contract.

We also consolidated contracts to reduce the administrative burden and to facilitate work of the Agency and the Ordnance districts. We used three types of contracts for prime contractors: one for research and development, another for production and a third for equipment identified with the supply or service contract.

Jupiter assembly line at the Chrysler-operated Michigan Ordnance Missile plant near Detroit. Jupiter engines, kept under raincoats to keep out dust and dirt, are moved into position for installation into the missile's booster section.

While we knew that we would deal with a single contractor for certain types of procurement we did not always know when, in what quantities, or with what urgency a particular requirement could be satisfied. A change article in prime contracts provided a means to transform the need into tangible results.

It allowed for additional procurement by change order of like items or services, new items or services, reduced scope, accelerated or decelerated performance or deliveries. Time and dollar limitations and provisions to protect against over-extending the capacity of the contractor were stipulated.

Reduction of lead time

The lead time normally required for the acquisition of facilities by the contractor for the Government's account was also reduced. It was cut to a few days and in emergencies, to hours. A production equipment screening expediter freely used telephone and telegraph to locate needed facilities. Other screening was conducted simultaneously within the Ordnance Corps and the Production Equipment Redistribution Group. The combined effort saved hundreds of thousands of dollars and a lot of time by finding needed equipment without recourse to purchase.

When a contractor required a priority the transaction was handled by phone or wire and the customary form came through after the action had been cleared and completed at necessary control points.

Contractor cooperation in all these innovations was gratifying. The coordinated approach simplified administration, eliminated confusion and greatly expedited procurement in support of the Missile Agency's major program—the Jupiter IRBM. It was first successfully launched in May, 1957, the first U. S. IRBM to achieve this feat, and that attested to the speed and efficiency with which the program moved.

Irons in the Fire

Powerful Rifle Unveiled

A shoulder-fired 90mm recoilless rifle, "capable of destroying the heaviest tanks known," has been announced by Lieutenant General Arthur G. Trudeau, Army Chief of Research and Development. The 35-pound, 4-foot-long rifle is designed to be employed by two soldiers, but can be handled by one man if necessary. The new rifle, known as the Medium Assault Weapon, fires a shaped-charge round which can penetrate the heaviest armor known. The weapon's effective range, 500 yards, is more than twice that of the 3.5-inch bazooka of Korea fame. In describing the rifle to a press conference at the Army's Frankford Arsenal in Philadelphia, General Trudeau said: "This kind of highly mobile weapon gives us the flexibility we need today for dispersed and far-flung battle operations in which the individual soldier—the loneliest man on the battlefield—may be called on to stand alone against the heavy preponderance of enemy manpower and armor."

Two soldiers demonstrate the new 90mm rifle which can knock out "the heaviest tanks known."

Pre-Flight for Monkeys

In order to obtain the best possible information from monkeys used in space investigations, the animals should be pre-conditioned to their celestial journeys. That's the opinion of Captain William B. Ross of the Army Medical Research Library, Fort Knox, Kentucky, who recently described his studies on eight monkeys to the fifth annual Human Factors Engineering Conference at Redstone Arsenal. The studies by Captain Ross revealed that the mere act of restraining a monkey will produce blood and temperature changes which investigators might be led to believe result from space travel. Blood and temperature return to normal as the monkeys become accustomed to restraint, suggesting a need for pre-conditioning the animals to immobilization. This might be done by strapping them into their form-molded chairs prior to lift-off or by keeping them strapped in the rocket nose cones during the days before being sent into space. The keynote address at the conference was delivered by Lieutenant General Arthur G. Trudeau, the Army's Chief of Research and Development. General Trudeau warned against making weapons systems so complex that they become masters of the men assigned to use them. "Men, not machines, win or lose battles," General Trudeau said.

Three-Dimensional Radar

Height, distance, and direction-finding capability are combined into a new single land-based radar unit, first of its kind to combine these features. The supersensitive seven-ton antenna now is in final assembly at General Electric's Ordnance Department in Pittsfield, Mass., which has received a $2 million-plus contract for production of additional units. The antenna establishes target position in three dimensions by transmitting several narrow radar beams rather than the single broad beam of standard radar antennas.

New Guidance System

A new long-range, all-weather guidance system, adaptable to either missiles or aircraft, has been developed by Goodyear Aircraft Corporation. The new self-contained system, called Pinpoint, can guide a missile to a direct strike on a specific target without external assistance. In a missile flight, the errors generated by the inertial or dead-reckoning components integrated into the new guidance system, are completely erased periodically. The accuracy of Pinpoint is independent of both the range and velocity of the vehicle of which it is a part, and the system is particularly adaptable to long flights over water and land masses. The new guidance system is being evaluated by DOD for a number of weapons systems.

New Facilities at Longhorn

New manufacturing and testing facilities for medium and large rocket engines of the solid propellant type have been unveiled at the Longhorn

KAMAN UNVEILS ITS "HUSKIE"

The new turbine-powered "Huskie" helicopter (H-43B), which has nearly twice the cabin space and lifting capacity of its piston-powered predecessor (H-43A), has been unveiled by Kaman Aircraft Corporation, Bloomfield, Conn. A rescue helicopter, Huskie has a capacity for eight passengers, plus pilot and co-pilot.

Ordnance Works in Marshall, Tex. Included in the new facilities are a new building of more than 46,000 square feet in area and two new test stands capable of handling the largest planned rocket engines. The rocket-engine production facilities at Longhorn are operated by Thiokol Chemical Corporation under Army Ordnance contracts. Because of the expansion, it is contemplated that the Pershing and possibly Nike Zeus engines will be produced at the Marshall plant.

New Criteria for CRAF

Under new standards established for the CRAF (Civil Reserve Air Fleet) program, those planes which have not been modified to military specifications (installation of wiring and brackets for communication and navigation equipment) no longer will be allocated to the program until modified or until a firm contract has been entered into for such modification. The CRAF plan would provide DOD with about 225 civil aircraft in case of emergency. Under the original setup, approved by commerce and industry representatives in 1952, all four-engine civil aircraft suitable for over-water operation were to be modified at Government expense to meet the military specifications. Modification of civil aircraft requires the cooperation of the civilian airline involved, DOD pointed out, urging all carriers to make the necessary modifications in order to remain in the CRAF program.

Soldier Jet-Assists Studied

In the picture below, a company engineer demonstrates a mockup of a small rocket-lift device being studied by Aerojet-General Corporation under a $56,000 Army contract to determine the feasibility of such individual jet assists. The device, consisting of a U-shaped fuel tank, pressurized air tank, and two thrust chambers, is

designed to enable combat troops to overcome terrain obstacles by moving quickly over short distances by a series of long slides or jumps, jet-assisted. The manual controls permit the operator to travel up, down, forward, and turn around at varying speeds. Hydrogen peroxide fuel passes through a silver catalyst, breaks down into superheated steam and oxygen, and gives each exhaust nozzle a variable thrust up to 150 pounds.

Space Flight in New York

A 30-ton space-environment chamber is now being built by Tenney Engineering for Republic Aviation, Inc., and sometime in 1960 the chamber will be able to take man on a simulated journey 150 miles into the ionosphere. The $500,000 chamber, which measures 14 by 30 feet, will be installed at Republic's Farmingdale, N. Y., astronautics center to test man, material, and equipment under space flight conditions.

HOT SPARKS

Western Electric Company, prime contractor for the Nike Zeus antimissile system, has been awarded a $188,402,905 contract for research and development work on that system. Work on the contract will be performed by Bell Telephone Laboratories, Whippany, N. J.; Western Electric, Burlington, N. C.; Douglas Aircraft Company, Santa Monica, Calif.; Goodyear Aircraft Company, Akron, Ohio; Lear, Inc., Grand Rapids, Mich.; Sperry Gyroscope, Great Neck, N. Y.; Burns & Roe, New York, N. Y.; Remington Rand Univac, St. Paul, Minn.; and Continental Can Company, Coffeyville, Kan.

A $24 million contract for continuation of work on the Pershing solid propellant surface-to-surface missile system has been awarded to Martin Orlando.

New Radar Navigator

A new self-contained radar flight instrumentation system, which makes possible precise navigation for all Army aircraft without dependency on ground based radio transmitters, is under development by Sperry Gyroscope Company.

Designated AN/APN-118, the integrated all-transistor system weighs only 120 pounds and features a nine-inch square map display which gives a visual picture of aircraft position and progress. Exact location of the plane and its direction of flight are electronically indicated by a moving pointer against an aeronautical or grid map of the area. A tape display gives the pilot the rate of climb and altitude both for maintaining level cruising and for absolute measurement above ground. A similar display gives groundspeed and airspeed data.

Pilot checks map display on new system.

THE MONTH'S BOOKS

Soviet Military Doctrine

WAR AND THE SOVIET UNION
By Herbert S. Dinerstein
Frederick Praeger, 1959
268 Pages; Index; $5.50

Reviewed by
RAYMOND L. GARTHOFF, *author of* Soviet Military Doctrine *(1953),* Soviet Strategy in the Nuclear Age *(1958), and* The Soviet Image of Future War *(1959), and other works in the field of Soviet military and political affairs.*

In this contribution to the analytic literature on Soviet military and political thinking, prepared for the U. S. Air Force, Mr. Dinerstein of the Rand Corporation has attempted to establish a connection between the political struggle for power of Stalin's successors and developments in Soviet military doctrine and strategy. The book examines certain revisions in Soviet military thinking, particularly on the role of surprise, and related strategic questions such as Soviet views on preemptive action and deterrence. The internal political conflict is reviewed from the standpoints of the influence of nuclear weapons on Soviet policy, and the use by political leaders of stimulation of the danger of war as a weapon in political in-fighting. The original and main contribution of the study lies in provoking thought on these political strategic issues during the factional conflicts of 1953-57. It is weakest in attempting to relate military doctrinal and strategic revision to the political controversy.

The historical reconstruction of the Malenkov-Khrushchev conflict of 1953-57 is interesting and instructive. The central hypothesis is that Soviet discussions of the danger of war are either unrelated, or inversely related, to their real estimates of such danger, and reflect domestic political lobbying. The discussion is well done and on the whole convincing. This very hypothesis, however, should presumably have counseled the author against accepting so readily views expressed or supported, say, by Khrushchev in 1953 or 1955, as representing either his real or his present thinking. The reader may conclude that the use of attacks on Malenkov's unorthodoxy and his vulnerability to charges of slack attention to Soviet defense needs do appear to have been more weighty than any real difference within the leadership over issues of deterrence. Indeed, many of Malenkov's "heresies"—on increased consumer goods, on the mutual destructiveness of a nuclear war, on "parity" in deterrence and prospects for peaceful competition, limited reduction in the armed forces, and others—have since been adopted by Khrushchev. One could only wish that the author had more consistently applied his own hypothesis on the political uses of statements on the dangers of surprise attack and of war in general.

The entire conclusion on "The Soviet View of Deterrence" is left to hinge on the premise that if one recognizes that war is *possible,* he must conclude that deterrence is not; a premise that would with equal validity apply to us, though fortunately few would be inclined to argue that the West is therefore not interested in deterrence.

According to this book, Khrushchev in 1954-55 favored a new preemptive attack doctrine, and Malenkov opposed it and favored deterrence instead. In this reviewer's judgment, this hypothesis cannot be substantiated. Aside from the fact that the author bases much on an undocumented attribution to Malenkov of the idea that war was not possible, he also ties to Khrushchev's rise in February 1955 the adoption of a policy of preparing a preemptive attack. Yet there is no evidence to support connection of Khrushchev with the acceptance of the doctrine of a contingency preemptive blow. The articles advancing that concept were approved for publication while Malenkov was still in office, and more important, seem on the basis of available evidence to have been due to the influence of Marshal Zhukov—also then on the rise—rather than to Khrushchev.

Mr. Dinerstein further concludes that in 1954 the Soviet air forces decided to support Malenkov and his views; but the foundation for this conclusion seems very tenuous indeed. The evidence offered is composed of two data, mutually inconsistent, neither of which seems justified. In the first instance, an attack on the Malenkov economic orientation made by Shepilov is cited, and Dinerstein comments that Shepilov "proceeded from the general to the particular, from 'heavy industry' to 'guidance systems.' He implied that the Malenkov faction was not only guilty of a general negligence to push heavy industry but also of a specific failure to develop guidance systems, an essential component of both long-range missile systems and active air defense systems." Why Malenkov, favoring deterrence, should be willing to cripple the basis for deterrent military capabilities, and why this should earn him the support of the air forces, are obscure even on the basis of the evidence as given. But in fact this whole question vanishes, because Shepilov did *not* say anything about "guidance systems"; the Russian term for that expression is *teleupravlenie,* and the word Dinerstein mistranslates, *telemekhanika,* means telemechanics, and refers to automation of baby-buggy production as much as it does to missiles. The second item adduced as evidence is a *Red Star* editorial criticizing an economics instructor at an air forces engineering school for having favored greater emphasis on light industry. But must one conclude, as does the author, that "No other explanation offers itself for *Red Star's* deliberately linking of the air force with Malenkov's ideas" than that the air force "had decided that its interests lay in the support of Malenkov and his views"? In fact, the *Red Star* editorial (parallel with editorials in civilian newspapers criticizing various adherents of the recently fallen view on light industry) had attacked those "among *individual economists* working in our higher *military educational* institutions" who had held such views. Kuznetsov, who happened to teach economics at the Zhukovsky Aviation Engineering Academy, was one such and was named as an example in the charge that such views, if permitted, would have had a bad effect on "the Soviet armed forces" in general. These illustrations suggest an overenthusiasm for the hypotheses advanced.

Let us turn now to the other major theme in the book, the changes in Soviet military doctrine. The discussions and revisions of late 1953 to April 1955 are reviewed, and there is a chapter on "Surprise and Initiation of War." In this latter discussion, one reads: "Appropriately, all the early evidence of ferment in Soviet thinking about military strategy was concerned in one way or another with surprise attack.'" While this would be "appropriately" so for the thesis of the book, in fact the assertion does not stand up. Surprise was but an incidental theme in the debates on military science, and even the highly selective material presented in this book belies the claim.

The villain in Mr. Dinerstein's story is the Soviet doctrine on "the permanently-operating factors which determine the course and outcome of wars." These factors—essentially the basic economic, morale-political, and military potentials—have since 1956 usually been termed "the decisive factors," rather than the "permanently-operating factors." But Mr. Dinerstein ignores the impressive literature in recent years based on the content of these factors, and even the references to them in sources that he does draw upon. His book is in demonstrable error when it states that these factors have been characterized as "inadequate on the whole"—a statement for which no reference can be given. It states that "after April, 1955, the Soviet press carried but a few scattered references to the permanently-operating factors." This reviewer could cite at least a dozen post-April 1955 authoritative reaffirmatives of the formula on the permanently-operating factors, and dozens more from 1957, 1958 and 1959 which paraphrase and uphold the doctrine on the decisive factors.

One of the main theses of this study is that from 1955 on, "the aim of Soviet policy was to create and maintain the ability to deliver the first blow," a hypothesis derived from the adoption in 1955 of a policy of preemptive action in case the enemy were irrevocably and imminently about to launch an attack upon the USSR. Mr. Dinerstein's arguments that Soviet force requirements were shaped by the contingent plan for preemptive action are not persuasive. He does avoid the pitfall, into which some have fallen, of equating Soviet concepts of preemptive action with preventive war. But the contention that there was controversy over allegedly conflicting strategies based on contingent preemptive action, and deterrence, is to this reviewer wholly unconvincing.

It is argued, for example, that the published Soviet comments on ICBM accuracy requirements demonstrate that their ICBMs are intended not for deterrence but for a first-strike. Soviet air defense is also said to be comprehensible only "in combination with Russia's preemptive doctrine for the initiation of war," and "makes little sense as a deterrent." There are many reasons for challenging the allegation that wanting accurate ICBMs and air defenses implies intention for a first-strike, but it is perhaps sufficient to recall our *own* interest in these very systems *for deterrence!*

War and the Soviet Union has developed, and in some instances originated, ideas on the interrelation of political and military considerations in over-all Soviet strategy, down to 1957. This investigation has involved substantial tasks of exegesis. Use of military sources has been substantially selective, due to the focus of attention on surprise. There are a number of debatable points which, for the general reader, depend upon the degree of his confidence that the author has surveyed and presented *all* the evidence pertinent to the hypothesis he is testing. There are some baffling passages, such as the conclusion that "mobilized reserves can only influence the outcome of a war if the forces-in-being are victorious at the outset!" Finally, the linkage of doctrinal revision to political struggle, at the expense of other considerations, has contributed to overemphasis on discussions of preemptive action and lack of attention to the broad range of flexibility in Soviet military (and political) planning, doctrine, and capabilities. Nonetheless, the author deserves credit particularly for his useful analysis of the Soviet leaders' use of publicly stated views on the likelihood of war as a political football.

The Original Was Good

WEST POINT TODAY
By Col. Kendall Banning; edited by Col. A. C. M. Azoy
Coward-McCann, 1959
256 Pages; Maps; Index; $3.95

Reviewed by
LIEUTENANT WILLIAM H. ZIERDT, III, *Armor, a 1959 graduate of USMA, who as a cadet was features editor of* The Pointer.

West Point Today smacks of yesteryear. Throughout the book, which is supposedly brought up to 1959, are references to customs and procedures which are practically unknown to cadets and graduates of recent years. An example cited from the text is the outmoded practice of Yearling Corporals conducting new cadets through Beast Barracks.

The number of companies in the Corps of Cadets is repeatedly stated as 16, except in two places where poor editing allowed reference to "the twelve companies of the Corps." Actually the number is, and has been for quite a few years, 24. This is typical of some 50-odd errors directly attributable to poor revision in this fifth edition.

Colonel Banning's original work, published in 1937, is still interesting to those devoted to the Military Academy and its history; but the current edition has been changed just slightly enough that it does not present an accurate account of the Academy during any period of its 157-year history. The physical description of the grounds of West Point, in general, is good; but the lengthy passages devoted to the life of the cadet and the organization of the Corps are poor. The explanation of the Honor Code is as good as any I have seen although the cardinal precepts that a cadet does not lie, cheat nor steal are nowhere included.

The passages dealing with the history of the Academy are interesting, but as presented they are extremely incomplete and do not contribute materially to the worth of the book. Such matters as the salary of Thomas Johnson while he painted the mural in the Mess Hall hardly give a greater understanding of any element of Hell-on-the-Hudson.

The original book was good in its day, but the many revisions have been ineptly done and do nothing but detract from the historical significance of Colonel Banning's original work.

Air History Anthology

THE IMPACT OF AIR POWER
Edited by Eugene M. Emme
D. Van Nostrand Company, 1959
914 Pages; Illustrated; Index; $12.50

Reviewed by
STEFAN T. POSSONY, *member of the faculty of Georgetown University and Foreign Policy Research Institute, and author of* Strategic Air Power.

Topical anthologies which completely cover a whole historical period can be produced about once in a generation. Dr. Emme, formerly professor of International Politics at the Air University and now a professional analyst with the Office of Civil and Defense Mobilization, has come out with such a unique work. As airpower and its younger brother, space power, continue to make history, this book ultimately will have to be brought up to date. But I seriously doubt that for the period "from the Wrights to Schriever"—presumably General Schriever's first phase—this anthology ever will be superseded.

Emme's collection comprises 118 articles and documents dating back to 1881 and beginning in earnest with a 1914 memorandum on air defense by Winston Churchill, First Lord of the Admiralty. The authors of those original "writs" on airpower include presidents, ministers, scientists, historians, civilian analysts, and, of course, soldiers from the military services of all major powers. In short, almost everyone who ever said anything worthwhile on the subject, including all the great names of U. S. air history and some of the spokesmen for Soviet airpower, are represented. Moreover, pertinent documents by collective authors, such as excerpts from the U. S. Strategic Bombing Survey, the Air Policy Board, House and Senate committees, the Smuts committee, and British White Papers on defense have been reprinted. To complete the historical record, to interpret meanings in the light of recent experience, and to adumbrate the perspectives of the future, the author, with 12 enlightening commentaries from his own pen integrates those manifold texts into a coherent story.

At first glance it would seem as though Dr. Emme's work is of interest especially to historically minded audiences. Yet,

Selected Check List of the Month's Books

This run-down of some of the books received during the month preceding our deadline is to give our readers who like to follow current literature a monthly check list of the most important, useful and potentially popular books. Any of these titles may be purchased through the Combat Forces Book Service.

DEFEAT IN THE WEST. Juergen Thorwald. Ballantine Books, 1959. 256 Pages; Paper, $.50. Originally *Flight in the Winter*, this is the story of the German defeat on the Russian front, January to May 1945. Reviewed in *ARMY*, July 1952.

EDITING YOUR COLOR MOVIES. George W. Cushman. Camera Craft Publishing Company, 1959. 96 Pages; Illustrated; Index; $1.95. Attempts to show how to think cinematically—a very special mental process that is the one all-important key to successful movie editing.

ESSENTIALS OF MILITARY TRAINING. The Stackpole Company, 1959. 536 Pages; Illustrated; Index; $6.50. Seventh edition of a textbook for all components, brought up to date. Weapons section includes the latest developments. New material on Trainfire, guerrilla warfare, ABC training, marches and bivouacs, battle drill, fortifications; supply and cost consciousness, Army achievements and traditions.

THE EXPLORATION OF SPACE. Arthur C. Clarke. Harper & Brothers, 1959. 200 Pages; Illustrated; Index; $4.50. First published in 1952, this edition is brought up to date in the light of Sputnik, Explorer, and the Atlas missiles. Color photos and line drawings.

THE GENERAL FOODS KITCHENS COOKBOOK. Random House, 1959. 436 Pages; Illustrated; Index; $4.95. By the women of General Foods Kitchens. Something novel in cookbooks: arranged by situation. Ideal for the service wife. Daytime entertaining, parties for all ages, holiday affairs, family milestones, feeding crowds, unexpected guests, holiday meals, foreign cooking, seated dinners and buffets, all with accompanying recipes.

MAPPING THE WORLD. C. B. Colby. Coward-McCann, 1959. 48 Pages; Illustrated; $2.00. The story of Army Map Service and the men who make our maps all over the world.

NAVAL CUSTOMS, TRADITIONS, AND USAGE. Vice Adm. Leland P. Lovette. U. S. Naval Institute, 1959. 358 Pages; Illustrated; Index; $5.50. Fourth edition. For 25 years the classic on nautical terms, naval customs, and military and naval etiquette. Interesting to Army personnel too, many of whom will sooner or later have to learn about Navy ways.

ORGANIZING PEACE IN THE NUCLEAR AGE. New York University Press, 1959. 245 Pages; Index; $3.75. Eleventh report of the Commission to Study the Organization of Peace. Prepared by a panel of experts, it examines the possibilities of international regulation of nuclear power.

ROCKET CITY, USA. David S. Akens. The Strode Publishers, 1959. 95 Pages; Illustrated; Paper, $.95. Redstone Arsenal and Huntsville are Rocket City, and this tells of their activities and associations. Interesting text with fine photos, from Able and Baker in the sea, to Pioneer IV on its way.

SPACE AGE DICTIONARY. Charles McLaughlin, editor. D. Van Nostrand Company, 1959. 128 Pages; Illustrated; $5.95. An illustrated dictionary of terms from the rapidly growing fields of rockets and space travel. Clear explanations in everyday language of every important topic, from artificial satellites to relativity.

since this record of history is in the nature of a checklist of intellectual error and insight, those who carry responsibilities for the future will consult the tome with even greater profit. Problems such as total war, missile and nuclear warfare, small wars and limited military operations, Soviet air policy, European and Asiatic airpower, security diplomacy, disarmament and astronautics are discussed thoroughly. In addition, the reader will find much information on topics such as Soviet technology, naval aviation, civil defense, the new British concepts of defense, airpower and communism, the frontiers of science, and even the anthropology of astronautics. On almost every page voices from the past give valid counsel for the future.

Many of the arguments are based on the premise that nuclear surprise attack is the central military factor in the present historical period when "offensive operations have far outpaced defensive capabilities." The modern battlefield is about to be extended to the moon, and modern battle poses for mankind the ineluctable problem of sheer physical survival. Emme reminds us that war, unfortunately "has been the most durable of social institutions." Whenever memories of Soviet aggression are growing dim and talk about disarmament and lowering of tension is arousing hopes in the "hearts of well-intentioned humanitarians," a new threat emerges and a new evil design becomes visible. "For American policy makers and students of world affairs either to belittle or to magnify the capabilities of Soviet air power might prove an historical error of catastrophic magnitude." A similar error would occur if we were to approach our problem in a pessimistic vein, assuming that a nuclear war never can be won but can only be lost. "Should world war III not come, its circumvention will probably result from the creation of a military posture indicating victory in such a war, a potential which would dissuade the would-be aggressor."

Those are some of the future-oriented thoughts which Dr. Emme leaves with us. This book by a hundred-odd of history's outstanding aeronauts overlooks no major problem of military aviation which produced controversy. Emme really has provided us with a full-grown history of airpower as an instrument of national policy; and he has done so by giving us within two covers, a comprehensive collection of practically all those texts which stirred former generations and which have lost nothing of their dramatic impact. It is not the least of the volume's merits that it captivates the reader. I must confess that Dr. Emme robbed me of a whole night's sleep.

The ground soldier should not overlook this book on the comfortable assumption that it is just another piece of "airpower propaganda." Not so. Emme reprints only valid documents which contributed to the making of history and which show where both airmen *and* ground soldiers have been right *and* wrong. These texts could provide a common platform of shared experience. Thus, they should lead to better intellectual understanding among the services. A tombstone of delusions and prejudices, Emme's volume also is a signpost to true military integration. Thoughtful soldiers worrying about future security owe a vote of thanks to historians of Emme's caliber.

The Courage of GI Joe

BATTLE: THE STORY OF THE BULGE
By John Toland
Random House, 1959
400 Pages; Illustrated; Maps; Index; $5.00

Reviewed by
LT. COL. DONALD P. BOYER, JR., *Armor, who served with the 7th Armored Division during the operations narrated in this volume.*

At 0530, 16 December 1944, the quietness of the Ardennes was shattered by a simultaneous eruption of heavy artillery, mortars, rockets, and even railway guns along the entire 85-mile Ghost Front of General Omar Bradley's 12th Army Group. From Monschau in the north to Echternach on the south, the entire front was aflame with a massive bombardment, which, as we so well

know, was the prelude to Hitler's last great offensive—the opening bars of a great battle symphony which would rival the Battle of Stalingrad in scale, ferocity, and impact.

John Toland, free-lance writer, has created in *Battle* the full story of the Bulge, in all its moments of heroism or fear, in its events of courage "above and beyond," in its incidents of mass surrender or massacre. It is told from the point of view of participants on both sides—officers, enlisted men, civilians and innocent bystanders. It reads like a novel, and as you close the book with the reading of the Epilogue you feel as if the entire battle had unfolded before you on the former TV program, "You Are There."

For more than a decade those of us who participated in the Bulge have looked for a telling of the story, big and little picture, for an evaluation which would pay a deserved tribute to those who gave of themselves so gallantly to halt the last great German counteroffensive. *Battle* tells this story, and now the search is ended.

No one unit is singled out for special mention; instead there are first-person stories from all the divisions, and what a long roster they are: 1st, 2d, 4th, 5th, 9th, 26th, 28th, 30th, 35th, 75th, 80th, 83d, 84th, 87th, 90th, 99th, and 106th Infantry; 17th, 82d, and 101st Airborne; 2d, 3d, 4th, 6th, 7th, 9th, 10th, and 11th Armored. No one soldier is portrayed as the man of the hour, unless it be the American GI. Of him, the author sums it up:

"The battle was won not by chance, by force of numbers, or by overpowering air superiority. It was won by the GI, by his ineffable qualities. The things that made him a poor garrison soldier—independence, cockiness, love of luxury—made him finally a deadly fighter . . . he soon learned that there was only one way to survive: he had to fight. And he fought, not for political or ideological reasons, but for his life.

"The GI went into the war with a basic philosophy—to do as little as possible. He was always only as good as he had to be. In the Bulge he had to be very good. . . ."

One popular bugaboo concerning the Bulge always has concerned the failure of Army Intelligence. The events which created this situation are recounted in detail, including the meticulous care exerted by the Germans in order to attain an almost complete security blanket. True, there was information at hand which might have indicated a change in the static quiet of the Ghost Front: reports of masses of German troops with huge tanks marshalling 20 miles behind the Siegfried Line, capture of several prisoners who told of rumors of a big attack, the noise of tank engines behind enemy lines where no tanks previously had been located. But no one believed the Germans would launch an assault, certainly not in the dead of winter in the heavily forested Ardennes.

Toland's thesis (similar to that of Luxembourger Lt. Col. Melchers, whose *Les Deux Liberations Du Luxembourg* was reviewed in the September 1959 issue) is: "The entire Allied World must share the blame. On the night of December 15, 1944, it breathed the air of complacency, optimism, and self-delusion. . . . For the basic premise—that Germany was capable of mounting an all-out offensive—was unacceptable to everyone in authority. What led the Allies to the edge of disaster in the Ardennes was not so much a failure of Intelligence as of imagination."

With these two ideas of the author in mind—that the American GI learned to fight and to fight effectively when he had to, and that the shattering surprise of the German counteroffensive stemmed from a lack of imagination and a general feeling of complacency throughout the Allied world—the greater value of *Battle* is brought forth. Certainly it is recognized that the volume would be of great interest to all soldiers, former and present, who participated in this greatest of all American winter battles; any well-written military history has this appeal. But this story, told in all its first-person realistic truthfulness, has a greater appeal; it should be read by all Americans, civilian and military, for *Battle* actually is an inspiration. It teaches one lesson so vital for these troublesome days of the present and the future: we must not through ignorance, complacency, or material interest permit ourselves or our country to underestimate an opponent; we must not forget our great American heritage of courage and freedom; and we must not forget the capabilities of our servicemen when the chips are down.

Engineers at War

UNITED STATES ARMY IN WORLD WAR II. The Technical Services. Corps of Engineers: Troops and Equipment
By Blanche D. Coll, Jean E. Keith, Herbert H. Rosenthal
Office, Chief of Military History, 1959
622 Pages; Illustrated; Maps; Index; $4.00

Reviewed by
LT. COL. ERNEST L. PERRY, *on duty with the Strategic Planning Group, Office of the Chief of Engineers, who had extensive training and combat experience in World War II as Engineer troop and staff officer.*

According to this book, during the period between World Wars, military planners were almost universally preoccupied with tactics. Logistics and supply services, while recognized, were either totally underestimated or relegated to a secondary role. This engrossing account of the part played by the Corps of Engineers in re-educating itself and tactical planners in the concepts and requirements generated by new technological developments, constitutes both excellent historical data and a portent of the future. Older members of the armed forces, who served through the reorganization throes of the Army during the early phases of World War II will find many interesting personal anecdotes. Others, more recently arrived on the military scene and accustomed to "normal" engineer support, will probably be amazed to discover that tests of the triangular division in 1937 resulted in a recommendation for an organic engineer company of only 175 officers and men. Even more shocking, in the light of subsequent developments, is the information that no organic engineer support was included in the initial armored concept.

The trials of such members of the Corps of Engineers as Captain Bruce C. Clarke, Acting Engineer for the 1st Armored Division in 1940, in providing tactical bridging capable of supporting greatly increased weights and mobility of the new Armored Force, make fascinating reading. The debt we owe to such far-sighted planners for their realization that military mobility is geared to construction ability becomes apparent as the book develops.

New problems encountered in the organization and training of a Corps of Engineers capable of worldwide deployment and, in particular, the movement into the Pacific area, demonstrated the need for service and construction troops far in excess of the anticipated proportion to total forces. The unexpected and tremendous demand for airfields, roads, ports, petroleum pipelines, warehouses, and hospitals, took even Corps of Engineer planners by surprise.

Methods utilized in coping with the organization, training, and equipment problems during 1940-43 provide valuable lessons to all present military students. It was during this period that the Corps expanded into the largest engineering and construction force in the world. Such expansion was made possible through the efforts of that small select group of Regular officers who were educated and trained on assignments to large civil works and other federal projects, and technically qualified civilian Engineer Reserve officers who helped to form the nucleus around which this expansion took place. Of equal importance to the war effort at this time was the technological advance being made in developing construction equipment capable of supporting combat operations. The Engineers, working in coordination with production specialists and manufacturers of construction machinery, brought an evolution in rapid logistic support of Army operations far in excess of any-

thing envisioned prior to World War II. This technological development combined with better technically trained troops demonstrated forcefully that effective mobility in war is directly related to the quantity and quality of the construction capability in the theater. In this connection, a major problem of Engineer planners was in educating military planners outside their Corps in the fact that technically qualified engineer units, capable of utilizing complex construction equipment, cannot be developed by utilizing the low-quality pick-and-shovel type manpower available to the Corps during World War I.

In general, this volume will be of special interest to all soldiers, and to those members of civilian industry who contributed to the development of the Corps of Engineers and the Army during World War II. Younger members of the armed forces, industrial planners, and research organizations can learn valuable lessons by reviewing the problems generated through lack of understanding of the tremendous job of providing worldwide engineer support to Army operations.

The authors of this volume, in addition to their conscientious and exhaustive research effort, have compiled a frank and interestingly written document. Many appropriate criticisms have been included (for example, delayed acceptance of the Bailey bridge, and failure to offer suitable recruiting inducements to qualified civilian construction personnel). While the book's style, because of extensive use of footnotes, does not permit rapid reading, it is always interesting.

Organizing CWS for War

UNITED STATES ARMY IN WORLD WAR II. THE TECHNICAL SERVICES. The Chemical Warfare Service: Organizing for War
By Leo P. Brophy & Col. George J. B. Fisher
Office, Chief of Military History, 1959
498 Pages; Illustrated; Index; $4.00

Reviewed by
COL. WILLIAM M. GREENE, *Commandant, U. S. Army Chemical Corps School, who during WWII was Chemical Officer of XX Corps.*

There is always a fascination in examining an outsider's report on the activities of a group with which one is closely associated; and when such a report is a historical one, the fascination is multiplied. The preparation of this book could not have been simple, for the volume attempts to set forth the story of the great expansion of what was then the Chemical Warfare Service during and just before World War II. The raw material of the research was buried, partly in sundry general orders, staff studies and memorandums, but also, and more important, in the fragile and often biased recollections of the persons concerned. But Dr. Brophy has lived long with the organization and the people he describes, and he has caught a true likeness of his subject.

The history is really two stories. One is the narrative of the desperate state of U. S. defense in the thirties, with special regard to the Chemical Warfare Service. Around the world, there was strong sentiment that toxic-gas warfare was a particularly "inhumane" form of warfare. Key people in Government and even in the War Department General Staff were opposed to its use. From 1924 on, the phrase that was "generally accepted as a statement of policy and a guide to the activities of the CWS (was) 'Our peacetime preparations in chemical warfare will be based on opposing effectively any enemy employing chemical weapons.'" The result for the Chemical Warfare Service was that from the mid-twenties to the late thirties, appropriations were less than $1.5 million annually, and there were less than 500 officers and men in the Service until after 1935.

The second story relates the efforts of the members of CWS to organize themselves to cope with the tremendous expansion that ensued when war came, bringing with it the strong probability of gas warfare. It is a story of considerable complexity. Dr. Brophy has wisely elected to simplify it by spinning only the main threads of the story: the development of a supply program and the concomitant development of U. S. production capacity; the training of all military personnel in chemical warfare; the organization and deployment of the chemical mortar battalions as combat units; and the organization and development of chemical service units, including those serving the Air Corps. Each of these is a history of positive action achieved slowly against such odds as the distaste for chemical warfare on the part of certain high officials, the competing demands of other weapons systems, and the usual inertia and in-fighting of any large organization. Dr. Brophy shows us these obstacles clearly, but his book is no postbellum scandal sheet.

The training mission of CWS forms the subject of the second part. Written principally by the late Colonel George J. B. Fisher, it describes the development of the training organization to perform the mission. The same obstacles that plagued the parent organization also beset the training effort: questions of basic doctrine on the use of chemical agents (should our training be solely defensive?); the competition for time with the other subjects in the soldier's curriculum; the spreading thin of the limited number of trained chemical warfare personnel; the operation of chemical training centers; and the unexpected intrusion of the major problem of training civilian officials in defense against toxic and incendiary warfare. The paucity of footnotes in this section is some measure of Colonel Fisher's standing as an authority on wartime training in the CWS.

The whole story is well told, and stands as an object lesson of the high price America paid for her peacetime neglect of the national defense.

Hitler's Successor

MEMOIRS: TEN YEARS AND TWENTY DAYS
By Admiral Karl Doenitz
World Publishing Company, 1959
500 Pages; Illustrated; Maps; Index; $6.00

Reviewed by
LT. COL. H. A. DEWEERD, *USAR, former Associate Editor of* The Infantry Journal *and author of books on high commanders of both World Wars.*

At 1800 on the evening of 30 April 1945, an officer brought Admiral Doenitz a telegram from Hitler's bunker in embattled Berlin. It read: THE FUEHRER HAS APPOINTED YOU HERR ADMIRAL AS HIS SUCCESSOR IN PLACE OF REICHSMARSCHALL GOERING. CONFIRMATION IN WRITING FOLLOWS. YOU ARE HEREBY AUTHORIZED TO TAKE ANY MEASURES WHICH THE SITUATION DEMANDS. BORMANN. "This message," writes Doenitz, "took me completely by surprise"—a remark which could well be the theme song of this memoir.

Admiral Doenitz was surprised time and again in the course of his life. A submarine officer, he never expected to be appointed commander in chief of the Navy. He was "surprised" periodically at the technical progress and efficiency of the Allied antisubmarine campaigns. He was surprised at the attempt of German Army leaders to assassinate Hitler in July 1944. He was surprised to find himself regarded by Hitler as the most dependable Nazi of all German military professionals. He was surprised to be saddled with the task of liquidating the war which Germany began in 1939. He never expected to be convicted as a war criminal or to serve a long prison term.

To judge from these memoirs, Doenitz was just a loyal German sailor engrossed in his job during World War II. This kept him from knowing what was going on in Nazi Germany and the occupied areas. With a straight face he writes: "What I learned in 1945, after the capitulation, and in 1946 about the inhuman side of the National Socialist system made a profound impression on me." Before the International Military Tribunal at Nuremberg, Doenitz rationalized that what was really wrong was the Fuehrer principle. It was not wrong because of the barbarisms it perpetrated but because after all the "idealism, honest effort, and boundless sacrifice of the German people," Germany was defeated. Small wonder that this oft-sur-

prised man came out of his long imprisonment unrepentant and naive as ever.

The bulk of this long book, however, is not about the "twenty days" in 1945 when Doenitz acted as head of the German state. It deals with his ten-year career as a Navy officer, from his appointment as the leading U-boat expert of the Third Reich in 1935 to his final professional post as commander in chief of the Navy.

The main contributions of Doenitz were the development of an effective submarine fleet and of the wolf-pack tactic of surface attacks on Allied convoys. This concept came to Doenitz, along with others, in World War I. He organized an attack by two U-boats on a British convoy late in September 1918 which nearly cost him his life. The second submarine failed to show up at the rendezvous and Doenitz made his attack alone. In the ensuing melee he lost his boat and seven men. He never abandoned the idea, however, and when the time came in World War II he put the wolf-pack concept into operation with deadly effect.

Ironically enough, Doenitz published a book, *Die U-Bootwaffe (The Submarine Weapon)*, in 1939, in which he described in considerable detail his concepts of surface night attacks by groups of U-boats. But the British Admiralty paid no attention to this and when the wolf-pack tactic was put into operation it came as a surprise.

Doenitz devotes a great deal of space to a defense of his conduct of the submarine war. He traces in great detail the fluctuating course of the war against Allied shipping. His battles with the Nazi hierarchy for priorities and allotments of materials are recounted. Like most other writers of memoirs, Doenitz seldom admits to having made a mistake; other Germans made the mistakes.

American readers, who may have forgotten the severe shipping losses we suffered off the East Coast early in 1942, should be shocked at the unflattering picture of our national behavior drawn by the German submarine commanders who were slaughtering our ships and men. Doenitz writes:

"The conditions were almost exactly those of normal peace-time. The coast was not blacked out, and the towns were a blaze of bright lights . . . shipping followed the normal peace time routes and carried normal lights. Although five weeks had passed since the declaration of war, very few anti-submarine measures appeared to be introduced. . . . Anti-submarine patrols were wholly lacking in experience. Single destroyers . . . sailed up and down the traffic lanes with such regularity that U-Boats were quickly able to work out the timetable being followed. They knew exactly when the destroyers would return . . . a few attacks with depth charges were delivered . . . but the attackers did not display the requisite perseverance. . . . Merchantmen used their radio without any restrictions. They frequently signalled their positions. . . ."

That was how we looked to our naval opponents in the Atlantic, nearly a year and a half after the war had begun in 1939, and after the costly British experience in the submarine war.

The book throws new light on a number of subjects including: the loss of the warship *Scharnhorst*, the naval operations in the Black Sea, the 20 July 1944 plot against Hitler, and the new Walther submarines which Germany was building at the end of the war.

The South's Generals

GENERALS IN GRAY: Lives of the Confederate Commanders
By Ezra J. Warner
Louisiana State University Press, 1959
420 Pages; Illustrated; $7.50

Reviewed by
N. J. ANTHONY, *an Associate Editor of* ARMY *and member of the Civil War Round Table, who has done considerable research on the Civil War.*

I think this is one of the most important additions to the Civil War shelf. In today's flood of literature dealing with the Rebellion there are reprints and original works by the score, but all these merely repeat what someone else has related.

Warner does what no other has done accurately. His book contains the biographies of every one of the Confederacy's 425 general officers. (He excludes the nine commissioned in the field by Kirby Smith because they were not confirmed by the Confederate Senate.) From contemporary newspapers, biographies, and family papers, he has constructed biographies of all wearers of the wreath and stars, with particular attention to their war records. He wrote thousands of letters and traveled from Maine to California to establish or verify his facts. He lists 553 notes and 10 pages of bibliography.

As the author mentions, even the *Dictionary of American Biography* ignores 200 Confederate general officers. Also, I have found some of its biographies vague. DAB, for instance, will say that some particular subject was born "in South Carolina, in 1832," or that so and so after the war "disappears from history." The only other attempt to record vital statistics of Rebel generals is Wright's *General Officers of the Confederate Army*, published in 1911. In this you find an unduly high incidence of error, yet many biographers, including Freeman, had nothing else upon which to rely. Warner sets the records straight, and any reliance on previous works of this kind is risky. More remarkable, he has succeeded in obtaining a photograph of each of his subjects, except John B. Grayson.

Besides these biographies, Warner has worked up a fascinating introduction for his subjects. In this he includes statistics based on his discoveries. To name only a very few: who lived longest, how many were killed in action, the number of West Pointers, who were foreigners, prewar occupations, oldest and youngest, states of origin. (I was surprised to learn that seven rest in a cemetery in my neighborhood, in company with John Wilkes Booth; four others lie elsewhere in the city.)

Only one who has experienced the tedium of research can appreciate the amount of sweat that went into the compilation of this work. No Civil War library can be complete without it.

Marines in Pictures

THE UNITED STATES MARINES: A Pictorial History
By Lynn Montross
Rinehart & Company, 1959
242 Pages; $10.00

Reviewed by
BRIG. GEN. ANDREW T. MCANSH, *U. S. Army, who served an enlistment in the Marine Corps.*

The author of this pictorial history, former newspaperman and professional writer, is an official historian of the Marine Corps. As such, he was in a position to obtain a wealth of photographs from which those in the book were selected. They range from pictures of Marine uniforms of 1780 to current copter-borne operations from carriers.

International usage has acknowledged the tacit assumption that marines, as transitory shipborne forces, can land on foreign soil without the implication of hostilities usually associated with invading troops. From this background has stemmed their 200-odd amphibious landings; many small and bloodless, some like Tarawa and Iwo Jima, hard-fought affairs.

The book breaks down into ten major subdivisions. The first, "First to Fight," is essentially a preview of the rest of the book, with pictures from earliest days to the present, all shown under various captions taken from the "Marines' Hymn." The rest of the subdivisions range from "Marines in Cocked Hats" (1775-1812) to "Korea" (1950-53).

Mr. Montross has told his story well, in terse outline without undue heroics. At a time when writers are again lamenting the softness of American youth in and out of uniform, it is well to keep things in focus by pondering over such stories as this. For through it all runs a thread of gallantry, high esprit de corps, and devotion to duty. It all makes for good reading, and it reinforces Napoleon's dictum to the effect that courage is never out of style.

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The Association of the U. S. Army shall be an organization wherein all who are in accord with its objectives may join in the exchange of ideas and information on military matters, and in fostering, supporting, and advocating the legitimate and proper role of the Army of the United States and of all its elements, branches, and components in providing for and assuring the Nation's military security.

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CHAPTERS

AUGUSTA AREA CHAPTER—Chapter is engaged in an area-wide drive to recruit civilian members; features included TV program on 11 August with Mayor Beckum and Post officials participating, and full-page newspaper ad sponsored by local business and professional men. Teams of one soldier and one civilian are covering Augusta.

CHICAGO AREA CHAPTER—Chapter officers, with members of Chicago Chapter of West Point Society and members of Headquarters Fifth U. S. Army, met on 22 September to plan for participation in AUSA's West Point program.

CONNECTICUT CHAPTER—This rapidly growing Chapter held luncheon meeting on 11 September for members of Executive Committee; operating committees were appointed.

EAST BAY CHAPTER—Board of Directors meeting on 16 September discussed, among other matters, misuses of U. S. flag in local commercial enterprises, and made plans for next general membership meeting.

8th INFANTRY DIVISION CHAPTER—Quarterly dinner meeting on 7 August in Bad Kreuznach elected new officers.

GENERAL JOHN J. PERSHING CHAPTER—New officers installed at quarterly business meeting on 12 September. Chapter continues to be one of most active in working for AUSA aims and objectives.

GREATER LOS ANGELES CHAPTER—Chapter has sponsored three trips to Fort Ord, to enable civic leaders to observe training received by California soldiers. About 50 business and industrial leaders have participated.

INDIANA CHAPTER—New officers elected at general meeting on 10 September. Lt. Col. Elrod reported on AUSA's 1959 Annual Meeting; Lt. Pearson, also a delegate, expressed his gratification at government and industry support of AUSA as evidenced at the Annual Meeting. Other routine business also transacted.

KENTUCKIANA CHAPTER—New officers, including as President Brig. Gen. Dillman Rash (CG, 100th Reserve Division (Training)), installed on 23 September.

OZARK CHAPTER—Chapter presented 49-star flag to Fairview Elementary School, Fort Smith, and participated in flag-raising ceremony on 21 September. President James S. Beckman made the presentation; the flag was raised by MSgt. Daniel A. Reed, Secretary-Treasurer of the Chapter. Event resulted in much valuable publicity for the Chapter.

PIKES PEAK CHAPTER—The Chapter, teaming up with the Military Affairs Committee of the Colorado Springs Chamber of Commerce and the Army elements at Fort Carson and USARADCOM, put on what is undoubtedly the greatest single event by any individual Chapter. The recent Pikes Peak Army Exhibit, supervised by Lt. Gen. Charles E. Hart, CG of ARADCOM, drew 20,032 visitors. The exhibit included men, equipment, and weapons (including missiles), motion pictures, static displays, and pushbutton operating displays. Among the attractions were 14 shows, including a spectacular "Nike Missile Battery in Attack" demonstration by 6th Region, USARADCOM, which simulated an enemy attack. MP dog-handlers staged an exciting demonstration. Military and industrial equipment, a recruiting booth, an AUSA booth, and many other features made attendance valuable and interesting.

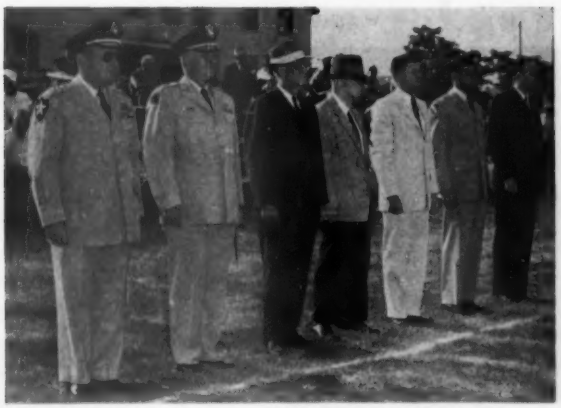
RICHMOND CHAPTER—Meeting on 23 September at Richmond Quartermaster Depot drew 52 members and 13 guests. Membership has almost doubled during the summer. Chapter has acted on USMA program. Film, "A Sharper Sword and A Stronger Shield," was shown.

RIO PIEDRAS, P. R. Cadet Lt. Col. Rafael Pagan, right, Captain of Puerto Rico Company, receives the charter for AUSA's first Company established outside CONUS. Col. Manuel Font, left, President of Antillas Chapter, presents charter while Col. Rafael Montilla, PMST, looks on.

FORT CARSON, COLO. Col. C. L. Heitman, Jr., ADC, 9th Infantry Division, presents a pennant for 100 percent membership by civilians of the section in Pikes Peak Chapter to Capt. R. E. Johnson (center), Post Signal Officer, and V. A. Peterson, Deputy Signal Officer.

FORT LEWIS, WASH. Members of Idaho State College Company, their guests and faculty members at a party during ROTC summer camp at Fort Lewis.

FORT LEAVENWORTH, KANS. Harold E. Purdy, right, President of Henry Leavenworth Chapter, presents plaque to Larry Nusbaum of Shawnee, Kansas, for winning exhibit on spectroscopy at Kansas City Science Fair.



FORT JACKSON, S. C. Reviewing party at presentation of charter to Greater Columbia Chapter on 19 June. Left to right: Lt. Gen. Clark L. Ruffner, Maj. Gen. Christian H. Clarke, Jr., Brig. Gen. William N. Cork, Samuel L. Latimer, William F. Smith, Lt. Col. John S. Baskin, and O. Stanley Smith, Jr.

GERMANY. Col. Theodore C. Mataxis, outgoing President of 8th Infantry Division Chapter, one of AUSA's largest, presents Service Award to Brig. Gen. (now Maj. Gen.) William F. Train, former Division CG, in recognition of his service as Chapter's President during 1958-59.

SANTA BARBARA-VENTURA COUNTY CHAPTER—September meeting, held in Ventura, heard Lt. Comdr. Sam P. Gullatt, USNR, speak on the need for a strong underseas fleet. Among the guests were Mayor E. T. Abbott, Santa Barbara, and Mr. Al Albinger, president of the Ventura Chamber of Commerce. Mr. Ted H. Wagner reported on AUSA's 1959 Annual Meeting.

SOUTHERN ARIZONA CHAPTER—A review conducted by noncommissioned officers was one feature of Fort Huachuca's welcome to the Chapter's Father-and-Son day, 12 September, hosted by the Electronic Proving Ground. Elmer P. Wohl, Vice President for Planning of Convair Division, General Dynamics Corporation, was the principal speaker. Clayton Smith, Chapter president, took the review.

SOUTH HAMPTON ROADS CHAPTER—Reorganization meeting on 8 September prepared for October election of officers.

ROTC COMPANIES

DAKOTA COMPANY, North Dakota Agricultural College—First meeting of the school year, on 23 September, revealed Company has 102 members. Principal business was planning events for rest of year, with joint dinners with Guidon, women's auxiliary, a popular feature.

FARRIS-WARE COMPANY, Prairie View A&M College—Meeting on 18 September planned events for coming school year.

INDIANA STATE TEACHERS COLLEGE ROTC COMPANY, Indiana, Pa.—Organization meeting in September elected new officers and began to prepare program for coming year. Theme of year's meetings is: "An Active Organization."

KEMPER MILITARY SCHOOL COMPANY—Organization and orientation meeting on 17 September elected new officers, and planned for its most active year.

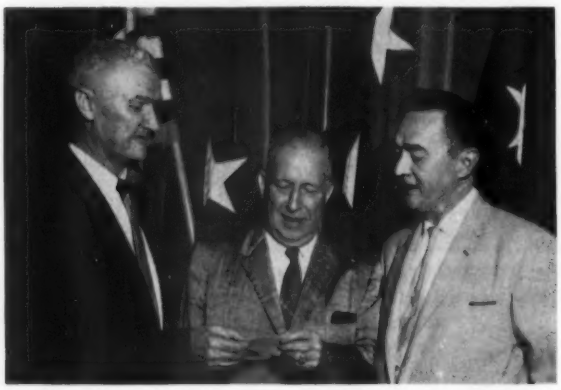
LOYOLA COLLEGE COMPANY, Baltimore, Md.—First meeting of school year held on 25 September; orientation to AUSA was principal purpose.

"SOONER COMPANY," University of Oklahoma—Organization meeting on 24 September set 200 members as immediate goal, to be attained by continuing the schedule of trips and other Company activities that have made it a leader in the past. Particular stress is to be placed on Company's mission of "selling" ROTC to incoming freshmen.

AUSA MEDAL AWARDS

THROUGH 30 SEPTEMBER 1959

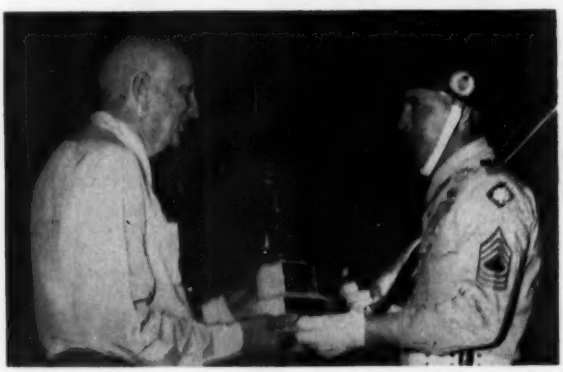
Gordon Military College: James E. Ethridge; **Montana State College:** Gene C. Shaw; **St. John's Military Academy:** James E. Christman; **Virginia Polytechnic Institute:** Kenneth A. Byrd; **USASA Training Center & School:** Maj. Richard S. Winstead, Capt. Charles R. Bradley, Jr.



FORT SAM HOUSTON, TEX. Mayor J. Edwin Kuykendall, center, receives his membership card in Alamo Chapter from Brig. Gen. William J. Sutton, left, Chapter President, at quarterly meeting held in Officers' Club. At right is Brig. Gen. John C. Hayden, Fourth Army Chief of Staff.

FORT SHAFTER, HAWAII. Dr. Wernher von Braun, Army missile scientist, with Gen. I. D. White, Commander in Chief, USARPAC, in his office after Dr. von Braun's address to Hawaii Chapter.

RYUKYU ISLANDS. Head table at July dinner meeting of Ryukyus Chapter. Left to right: Brig. Gen. George T. Powers, III, Deputy CG, USARYIS; Lt. Gen. William S. Lawton, Army Comptroller, principal speaker; Col. Raymond F. Field, USARYIS AG, and Lt. Gen. Donald P. Booth, High Commissioner and CG, USARYIS/IX Corps.



FORT SILL, OKLA. Col. E. C. Williams, President of Southwest Oklahoma Chapter, presents first-place drill squad trophy to MSgt Albert Porter, representing 2d Battle Group, 30th Infantry. Squad competed during AUSA picnic held in July at Fort Sill.

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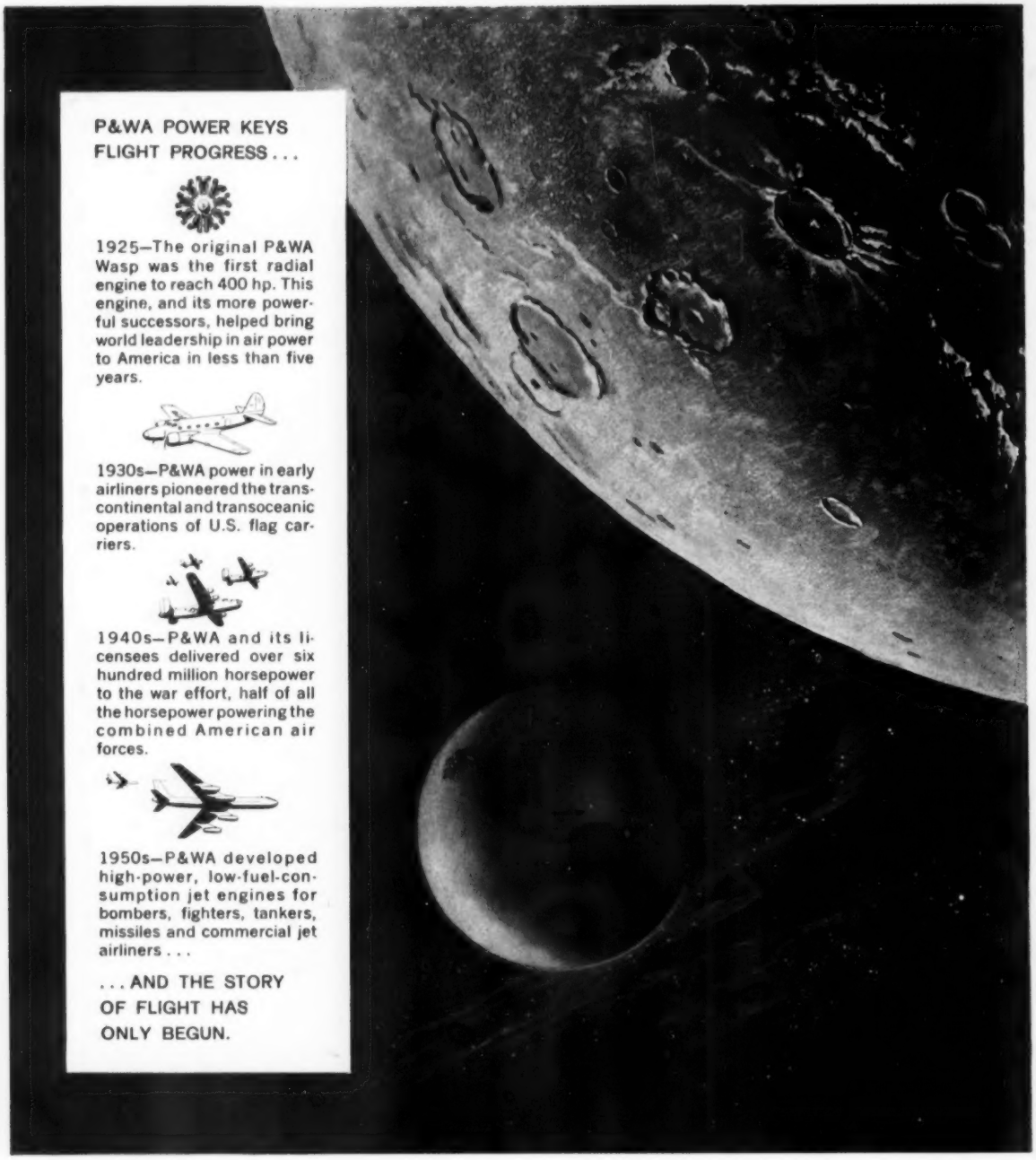
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